

**Exploratory analysis of intrusive thoughts in a community  
sample of mothers with young infants.**

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## DECLARATION

This thesis has been composed by myself and the contained herein is my own.

*Signature*           

T. Woodward

## ABSTRACT

**Aim:** To prospectively explore the phenomenon of intrusive thoughts in relation to mood variables such as depression, anxiety and obsessional tendencies in a community sample of mothers with young infants.

**Method:** Forty-eight mothers were assessed on measures of depression, anxiety and obsessionalism at approximately 35 weeks gestation and then postnatally at 4-6 weeks. The intrusive thoughts were assessed for content, form, frequency, intensity and dismissability. The relationships between all dependent variables and the predictive relationship between the pre and postnatal standardised measures were assessed.

**Results:** Intrusive thoughts of infant harm were common in this sample and concurred pre and postnatally. Frequency, intensity and dismissability of the thoughts were all related. Increases in depression, anxiety or obsessionalism postpartum were not observed. Prenatally, levels of depressive symptoms and state anxiety were both associated with difficulty in dismissing the thoughts. At postnatal assessment those who had higher scores on the Edinburgh Postnatal Depression Scale and the State/Trait Anxiety Inventory had more frequent thoughts, experienced them more intensely and had more difficulty in dismissing them. Those participants who responded to the thoughts experienced more postnatal anxiety and negative emotion. Prenatal scores on standardised measures were generally predictive of postnatal scores, young maternal age was also predictive of postnatal EPDS score.

**Discussion:** Pregnancy and childbirth did not significantly raise levels of anxiety, depression and obsessionalism in this community sample. However the experience of distressing intrusive thoughts of infant harm is common and rarely discussed with expectant mothers. Methodological strengths and weaknesses are examined, in particular the lack of a standardisation for measuring intrusive thoughts.

**Overview of Introduction**

Despite the biological nature of pregnancy and birth, this period of a woman's life is associated with many emotional and psychological issues and may be complicated both by biology and the woman's social and emotional environment. During pregnancy and the puerperium, changes in the psychological state of women have provoked much research into the aetiological background of disorders such as obsessive-compulsive disorder (OCD), postnatal depression (PND) and disorders such as posttraumatic stress disorder, which can present with elements of both OCD and PND. In addition predictive correlates of PND have also been extensively researched. However, it is evident that there is a lack of investigation into more sub-clinical levels of some of the symptoms of these disorders in women during pregnancy and birth. If it is presumed that all symptomatology is distributed along a continuum of experience rather than as a discrete entity, then this chapter of the female lifespan is disposed for prospective investigation of these symptoms due to the general predictability of the birth event.

This review will describe which articles to date have revealed what we know about pregnancy and mood disorders with reference to more general experience of low levels of disturbance, as well as the experience of females with psychiatric disorders such as OCD and PND. In addition to clarifying psychological symptoms in specific populations, this review will also discuss how indications of psychiatric disorder can also be found in the general population. I will illustrate how studies of intrusive obsessions/thoughts demonstrate the extent of this cognitive phenomenon in the

general population, who generally experience little or no other psychiatric symptoms. Pregnant women without either OCD or PND are a subsection of the non-psychiatric population and research has investigated intrusive thoughts in this sample. However, as this review will reveal, there remains much scope for investigating the emotional experience of these thoughts for females during pregnancy and the puerperium<sup>1</sup>.

## **PREGNANCY AND MOOD DISORDERS**

### **Pregnancy and anxiety**

Pregnancy and the puerperium are periods of extensive physiological transformation and upheaval, with marked hormonal changes, fluid and electrolyte imbalances, alterations in neurotransmitters, not to mention sleep and circadian rhythm disturbance (Ganong, 1991; Moore, 1991). Reproductive hormones in particular may affect brain, emotional or behaviour functions. The abrupt decline in oestrogen secretion that occurs at the time of delivery may contribute to the onset of mood disorders through a mechanism similar to withdrawal of antidepressants (Shear & Oommen- Mammen, 1995).

Predictably, the relationship between anxiety and pregnancy is not a straightforward one. Heightened bodily awareness cannot completely account for the presence of anxiety in pregnancy, or for the particular type of anxiety that may be experienced. Much of the research into anxiety and pregnancy investigates birth outcomes and their relationship to anxiety and stress. Those women experiencing more pre- and perinatal stress and anxiety appear to have significant higher rates of adverse birth

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<sup>1</sup> Time from the delivery of the placenta through to the first 4 weeks after delivery. This period is usually considered to be 6 weeks in duration.

outcomes (Dunkel-Schetter, 1998; Lobel, 1994). A prospective study by Lobel, Dunkel-Schetter & Scrimshaw (1992) discovered that high scores on three indicators of anxiety (state anxiety, perceived chronic stress and life event distress) predicted lower birth weight and shortened gestation after controlling for maternal substance abuse and medical risk. In the past, the retrospective and cross sectional design of such studies limited the robustness of the results, as did the consistent disregard by researchers of important social and demographic factors (Istvan, 1986).

Shear and Oommen-Mammem (1995) in their review of anxiety disorders in pregnant and post partum women, explain that the birth of a first child especially signifies a major role change for women. This change can be stressful and may contribute to anxiety. Also studies have shown (Arizmendi & Alfonso, 1987; Astbury, Brown & Small, 1995; Cowan, & Cowan, 1988; Lynch, 1996), that childbirth can be associated with difficulties in the spousal relationship, especially if financial hardship is a factor in the relationship or is a consequence of the mother giving up work. If the infant is born with or develops serious health problems and this is added to the burden of limited financial resources, stress and anxiety can increase to levels that are difficult for the parents to cope with (Cowan & Cowan, 1988). It appears to be the case that most research into antenatal anxiety is concerned with non-clinical samples experiencing specific anxiety/stress relating to their situation.

One difficulty posed by studies that measure prenatal maternal stress is the vague conceptualisation of stress. Thompson, Murphy, O'Hara and Wallymahmed (1997)

conceptualise stress as day-to-day hassles, in their samples of employed and non-employed pregnant women. Other researchers such as Kalil, Gruber, Conley and Sytniac (1993) conceptualised stress as a more stable familial related state, related to the supportiveness of the woman's partner and social factors such as the extent the pregnancy was planned and the income of the family. State anxiety is an emotional response to environmental stressors and is one of the most commonly studied affective states in pregnancy. As these two studies illustrate, the timescale required for the classification of an event into the category of state rather than trait anxiety is comparatively broad, varying from day to day, to a relatively longstanding situation of an unsupportive family environment. The biological state of pregnancy is discrete, lasting approximately 40 weeks. However, this relatively short period of time may involve significant changes in anxiety levels.

A prospective study by Da Costa, Larouche, Dritsa and Brender (1999) tracked daily hassles, pregnancy specific stress and state anxiety during pregnancy. Their research indicated that pregnancy related anxiety changed over the gestational period. This specific anxiety increased in the first and third trimesters and was related to gestational complications, especially in the third trimester. Concerns about anxiety levels specific to this distinct time period have been identified, as far back as the 1950's (Pleshette, Asch & Chase, 1956). In 1974, Burnstein, Kinch and Stern derived the Pregnancy Anxiety Scale from a study of the experiences of 61 pregnant women in Montreal. This research was not followed up until nearly 20 years later. Levin (1991) took what was then the Manifest Anxiety Scale (Burnstein *et al.*, 1974) and created a factor structure, which identified 3 factors. [1] Anxiety about being



pregnant, [2] Anxiety about childbirth and [3] Anxiety about hospitalisation itself. Levin (1991) was mostly concerned with race and religion issues rather than anxiety and pregnancy, that is why his standardisation of this test involved Hispanic and Afro Caribbean populations. Use of the Pregnancy Anxiety Scale (Levin, 1991) in this study would be problematic, as it has not been standardised on a white sample. Also, the inclusion of hospitalisation as an anxiety factor precludes its use with mothers who choose a home birth. Over the years research has supported the notion of a specific dimension of pregnancy anxiety and an identifiable scale to expressly measure this dimension (Arizmendi & Alfonso, 1987; Kumar, Robson & Smith, 1984; Lederman, 1996; Standley, Soule, & Copans, 1978). Recurrent themes of anxiety related to pregnancy are: concerns about the baby's welfare, worries about the labour and delivery, issues related to the woman's spouse (Arizmendi & Alfonso, 1987) and concerns about caring for a baby (Wadhwa, Sandman, Porto, Dunkel-Schetter & Garite 1993). Unfortunately, often the content of the statements in the scales specific to pregnancy anxiety do not translate to the anxieties felt after the birth.

Prenatal anxieties were conceptualised as preoccupations in a prospective study by Leckman, Mayes, Feldman, Evans, King and Cohen (1999) who administered the Spielberger State/Trait Anxiety Scale (Spielberger, Gorsuch & Lushene, 1970). Ninety five per cent of their mothers and fathers reported recurrent worries about the well being of their child, especially in and around the eighth month of pregnancy. Another discovery by Leckman *et al.* (1999) was that 37 per cent of parents (14 mothers and 16 fathers) reported recurrent intrusive thoughts concerning them

harming their unborn child. In most instances these were fleeting or momentary thoughts, the content and character of which was found to resemble the symptoms of OCD. Their content focused on shaking or hitting the baby, throwing the baby down the steps and dropping the infant from the top of a building. However only a small minority of mothers (12 per cent) in Leckman *et al.*'s (1999) study reported that these thoughts were a definite source of interference or caused moderate or severe emotional distress. A large proportion of the sample (68 per cent of mothers and 76 per cent of fathers) recalled reassuring themselves that excessive checking of the baby's condition or reassurance from health carers was unnecessary.

Research on specific anxiety disorders and pregnancy appears to be scarce. A literature search on the databases psycINFO and Medline from 1973 to 2004 produced only a handful of articles on post partum panic disorder (Altshuler, Hendrick, & Cohen, 1998; Metz, Sichel, & Goff, 1988; Millis & Kornblith 1992; Sholomskas, Wickamaratne, Dogolo, & O'Brien, 1994; Trad, 1994). One large sample research article that examined the relationship between three different specific anxiety disorders (excluding OCD) and pregnancy was that of Matthey, Barnett, Howie and Kavanagh (2003). They followed up the development of panic disorder, phobias, and generalised anxiety disorder in 408 women and their partners at 6 weeks post partum. This was a prospective study which recruited participants at antenatal classes and measured levels of different anxiety disorders at 6 weeks post partum. The percentages for phobias were 10.6 per cent, panic, 2.7 per cent and generalised anxiety disorder, 1.9 per cent. None of these participants met criteria for depression. When depression was included, the rate of women experiencing clinical

levels of distress, increased from 50-100 per cent. The sample in this study was non-psychiatric. However no information on previous psychiatric history was taken and although the methodology was prospective in that the participants were recruited antenatally, no antenatal measures were taken. At 6 weeks postpartum the participants were asked to retrospectively remember symptoms before and during pregnancy. Matthey *et al.* (2003) make the point in this study that too often anxiety is overlooked in favour of depressive symptoms in post partum women, but often the level of distress felt can only be accounted for by assessing for both disorders. A specific feature of the anxiety in women who experience panic disorder was illustrated in two case studies (Altshuler *et al.*, 1998; Metz *et al.*, 1988). These two case descriptions of women with panic disorder during and after pregnancy portray the experience of distressing symptoms with a typical pattern being that of the mother unable to leave the house and at the same time experiencing fearful thoughts of harming her baby similar to those found in women with OCD.

The literature on pregnancy and anxiety investigates different aspects of this mood disorder. The primary focus of much of the research appears to be on the general effect of anxiety antenatally to the birth outcome (Brouwers, Van Baar & Pop, 2001; Goldman & Owen, 1994; Van den Bergh, 1990). While this is understandable, there appears to be little consensus in the literature of what constitutes anxiety during this time. Some researchers use the experience of daily hassles (Da Costa *et al.*, 2000; Powell & Drotar, 1992) as their criterion as anxiety, while others describe the experience as state anxiety (Brouwers *et al.*, 2001; Sjoestroem, Thelin, Marsal & Valentin, 2003; Van den Bergh & Marcoen, 2004). Research in this area sometimes

neglects the fact that there are specific anxieties, that although mediated by social factors, are exclusive to the event of pregnancy and birth (Arizmendi & Alfonso, 1987; Burnstein *et al.*, 1974; Leckman *et al.*, 1999). Prospective studies have even indicated that levels of this anxiety change over the gestational period (Arizmendi & Alfonso, 1987; Da Costa *et al.*, 2000). Some researchers focus on particular anxiety disorders and pregnancy (Leckman *et al.*, 1999). Of note in the study by Leckman *et al.* (1999) is the overlap between symptoms of anxiety and the reoccurring theme of anxious intrusive thoughts that are experienced by the anxious mothers.

### **Pregnancy and Obsessive-compulsive disorder**

Recent reviews of pregnancy and obsessive-compulsive disorder (Abramowitz, Schwartz, Moore & Luenzmann, 2003a) have concluded that despite methodological weaknesses in studies in this area, pregnancy and the postpartum period appear to be associated with the onset of OCD and possibly the exacerbation of the condition if it is already present. OCD is characterised by unwelcome recurrent thoughts and ideas (obsessions) that give rise to anxiety and urges to perform mental or behavioural rituals (compulsions) in an effort to alleviate the anxiety (Salkovskis, 1985). Few studies have systematically examined the impact of pregnancy and the post partum period on the course of OCD. Buttolph and Holland (1990) retrospectively evaluated 39 women and 21 men for their recollections on what worsened or precipitated their OCD symptoms. Twenty-seven (69 per cent) of the women identified pregnancy and childbirth as precipitating or worsening OCD symptoms. Triggering events for onset of OCD appeared to be infertility (7.5 per cent;  $N=2$ ), pregnancy (22 per cent;  $N=6$ ) and birth (29.5 per cent;  $N=8$ ). Triggering events for exacerbation of symptoms were

miscarriage (7.5 per cent;  $N=2$ ), pregnancy (11 per cent;  $N=3$ ) and birth (22.5 per cent;  $N=6$ ). The study by Buttolph and Holland (1990) was weakened by the low response rate of the survey they sent out (33 per cent). And the results are difficult to interpret due to the small number of respondents and the small numbers that are represented by the percentages they cite. In addition, the survey did not provide an item for the respondents to indicate that none of these events served as a stressor, suggesting that those able to identify a particular life event prior to the worsening or onset of their symptoms were the minority and those not able to identify a trigger, did not bother to reply.

Research by Neziroglu, Anemone and Yaryura-Tobias (1992) controlled for some of the methodological weaknesses, identified above in the Buttolph and Holland (1990) study by comparing 2 groups of women with OCD. Those women who did and those who did not have children were asked which life events they associated with the onset of OCD. Their findings were consistent with those of Buttolph and Holland (1990) in that among the women with children, 39 per cent experienced OCD onset with pregnancy. Pregnancy was associated with OCD onset more than any other life event. In addition they also found that in the 4 women who had termination of pregnancy, 3 of them associated this event with the onset of their OCD symptoms. For those women who did not have children life events such as physical illness (8.5 per cent), moving house (4.3 per cent) and death of a loved one (4.3 per cent) were associated with the onset of OCD. Notably, termination of pregnancy was also associated with OCD onset for 6.4 per cent of the women without children. This group also had a significantly earlier onset of symptoms and Neziroglu *et al.* (1992)

suggest that the chronicity of their condition may have contributed to their reluctance to become pregnant. This was confirmed by at least one subject in their study.

Williams and Koran (1997) assessed the relationship between pregnancy/child birth and the onset or worsening of symptoms in a sample of women with OCD. They used telephone interviewing to assess OCD symptoms premenstrually, during and after pregnancy in 57 female outpatients. Of the 29 subjects with pre-existing OCD who became pregnant, 20 described no change in symptoms during pregnancy. Four women described some improvement. Post partum exacerbation of OCD symptoms was reported by only 7 of the 24 participants with pre-existing OCD who completed full term pregnancies. The advantage of this study over Buttolph and Holland (1990) is the larger sample size and the fact that the data collection method is unaffected by response bias. Williams and Koran (1997) speculate that the premenstrual and post partum exacerbation of OCD symptoms in some women suggest that the course of the disorder may be influenced by changes in gonadal hormones. This hypothesis is supported by studies demonstrating the efficacy of Serotonin agents in the treatment of OCD (Bareggi, Bianchi, Cavallaro, Gervasoni, Siliprandi & Bellodi, 2004; Geller, Biederman, Stewart, Mullin, Martin, Spencer & Faraone, 2003; Vaswani, Linda, & Ramesh, 2003). Progesterone and oestrogen both modulate the nervous system Serotonin uptake and turnover (Ehrenkranz, 1976). As with all of these studies, Williams and Koran (1997) selected outpatient samples to collect retrospective self-report data. For a true examination of the relationship between OCD and pregnancy, prospective studies of community samples need to be undertaken.

Maina, Albert, Bogetto, Vaschetto and Ravizza (1999) assessed the occurrence of potentially traumatising life events among males and females, both with and without OCD. The results did not show a significant excess of life events in patients compared with health controls and no differences in life events were detected between OCD patients according to gender. However, when examining the type of events, OCD females were more likely than normal females to report exposure to post partum events and obstetric complications, providing support for OCD onset during the puerperium, but not during pregnancy. In 87 per cent of post partum OCD females, the disorder developed in women who already had obsessive symptoms before pregnancy. This group were significantly more likely than controls to have given birth to a child (24.2 per cent vs. 6.1 per cent). The authors do not elucidate whether these two findings are linked. Presumably unlike the early onset OCD women, in Neziroglu *et al.*'s (1992) study, who were much less likely to become pregnant, the sample reported by Maina *et al.* (1999) exhibited fairly mild symptoms. Whether the women took this into account when deciding to have children can only be speculated. Although also retrospective, Maina *et al.* (1999) tried to control this methodological weakness to an extent by only investigating the life events of those patients whose OCD had developed within the last two years. They also excluded those patients with concurrent depression, and by doing so controlled for a possible highly confounding variable. Their failure to confirm an association between pregnancy and onset may reflect this methodological influence. It is possible that in those studies where an association between OCD onset and pregnancy was found, the onset was actually due to co-morbid depression and not only to OCD. Unlike the other studies, Maina *et al.* (1999) set criteria for "onset" of symptoms. This was



defined as the first occurrence of symptoms that caused marked distress and were present for more than 1 hour a day or significantly interfered with daily functioning, within a 4-week period. Maina *et al.* (1999) also used a continuum of OCD symptoms as measured by the Yale-Brown Obsessive Compulsive Scale (Y-BOCS: Goodman, Price, Rasmussen, Mazure, Fleishmann, Hill, Heniger & Charney 1989a; Goodman, Price, Rasmussen, Mazure, Delgado, Heniger & Charney 1989b), rather than a discrete diagnosis. The use of this measure provided the researchers with an opportunity to explore the obsessional content in this sample. All of the post partum OCD women ( $n = 8$ ) had significantly higher aggressive obsessions compared to only 54 per cent of the non-post partum OCD women ( $n = 13$ ).

The content of the anxiety provoking obsessions in samples of women with puerperium related OCD has been investigated in a few studies. The majority of the women in these studies appear to have developed obsessions that were meaningful to their circumstances at the time. Buttolph and Holland (1990) identified that most obsessions in OCD women whose onset was associated with birth, were related to themes of contamination. However, one participant in their sample who described an increase of symptoms post partum, experienced obsessions about harming her infant. She avoided knives because of extreme anxiety and was obsessed with images of dead babies falling from the sky. Buttolph and Holland (1990) note that the participant experiencing these types of images also had a BDI score of 20, indicating the presence of moderate postnatal depression.



Sichel, Cohen, Dimmock and Rosenbaum (1993a) retrospectively identified 15 women with past histories of anxiety disorders, who developed first onset OCD during the puerperium. These participants experienced a characteristic constellation of symptoms that comprised of disabling intrusive obsessions about harming their babies. Rituals were not observed in any of the subjects but all 15 developed some degree of avoidance of their infants, usually relating to obsessional stimuli such as knives or the infant itself. In a related study Sichel, Cohen, Rosenbaum and Driscoll (1993b) described 2 cases of post partum OCD women who reported fears of stabbing their babies; again both developed avoidance behaviour relating to both the child and to knives, but no rituals were observed. Sichel *et al.* (1993b) note that mental rituals were not assessed in these cases.

As previously mentioned, depression is common in people with OCD as are sub clinical dysphoric disorders characterised by low self esteem, guilt and indecisiveness. However it is unclear whether mood disorder is related to obsessions, compulsions or both. Ricciardi and McNally (1995) compared OCD symptoms in 150 patients with OCD and previous depression, OCD and current depression, and OCD patients who had never experienced depression. Comparisons were made between Beck Depression Inventory (BDI; Beck, Steer & Brown, 1993) scores and scores on the obsessions and compulsions subscales of the Y-BOCS. In the OCD and current depression group, the authors found a significant correlation between BDI and the Y-BOCS obsessional subscale, but not for the BDI and the Y-BOCS compulsions subscale. The results indicate that concurrent mood disorders seem selectively associated with worsening of obsessions, but not compulsions. This

differential effect was true for sub clinical dysphoric states as well. The effect was unrelated to the content of the obsessions. It appears that low mood has a differential effect on the two components of OCD. The intrusive obsessions worsen, but this does not necessarily lead to a behavioural increase in compulsions.

There appears to be evidence in the literature that pregnancy related events are associated with OCD (Abramowitz *et al.* 2003a). The difficulty arises in defining the exact nature of the relationship. Researchers link pregnancy and pregnancy related events, such as termination of pregnancy, with onset and worsening of OCD symptoms, even in women with no children (Neziroglu *et al.*, 1992). However, the studies are often retrospective (Sichel *et al.*, 1993a; Buttolph & Holland, 1990) and weakened by small samples (Sichel *et al.*, 1993a, 1993b). Those studies with larger samples often measure obsessional symptoms categorically rather than along a continuum and do not account for co-morbid depression in their results (Neziroglu *et al.*, 1992; Williams & Koran, 1997). Because of this methodological error, studies cannot claim that changes in symptoms are due to OCD and not concurrent depression. This is especially important if depressive symptoms can alter obsessions and compulsions differentially as has been suggested.

### **Post Natal Depression and Obsessive Symptoms**

Descriptions by clinicians of the experience of postnatal depression also contain repeated references to disturbing intrusive thoughts about aggressive acts involving the infant and/or overwhelming fear of being left alone with the infant (Fernandez,

1992). Neonatacide is very rare, but it is known to be a risk in post partum depression (Resnick, 1969).

Wisner, Peindl, Gigliotti and Hanusa (1999) compared obsessional thoughts and compulsions in post partum women with major depression and non-post partum women with a major depressive episode, whom had at least one child. Among other clinical differences in the groups, the authors revealed that 57 per cent of women with post partum onset major depression and 39 per cent with major depression endorsed obsessions and compulsions. This was statistically insignificant, and did not support the hypothesis that obsessions and compulsions are higher in the post partum group. However, their clinical observation that the character of the obsessional thoughts differed was supported. Women with post partum onset major depression were more likely to have obsessive aggressive thoughts (N = 20, 95 per cent) compared to those with non-postpartum onset (N = 6, 60 per cent). The expressed examples given by the subjects in this study included putting the baby in the microwave, stabbing the baby, and throwing the baby over a railing or down the stairs.

Jennings, Ross, Popper and Elmore (1999) were the first to compare thoughts of harming infants directly in depressed and non-depressed mothers. Unlike the groups in Wisner *et al.* (1999), the depressed and non-depressed women were matched on demographic variables such as education, race, age, marital status and infant sex and age. 41 per cent of depressed mothers compared to 7 per cent of control mothers reported thoughts of harming their infants. Other than the diagnosis of depression,

there were no other matching variables that were associated with an increased likelihood in experiencing these thoughts. One weakness of this study was that the two groups were not selected by identical procedures. The depression group were given the full diagnostic interview, but the control group were administered a very brief interview, probably not long enough to establish a level of trust between the researchers and the women, where the disclosure of such intrusive thoughts might have been more likely. This may account for the much lower percentages of those experiencing these thoughts found in the non-depressed group. Jennings *et al.* (1999) report another limitation as being the measure with which these thoughts were assessed. A single question was asked regarding the presence of these thoughts. No information was revealed about the emotional experience of the thoughts, how distressing they were or how easily they were dismissed.

In contrast, the anonymous nature of the study by Abramowitz, Schwartz and Moore (2003b) may have yielded more reliable results from the respondents. They mailed surveys to 300 women and their partners asking this community sample of parents about their experiences of unwanted intrusive thoughts surrounding their children. Abramowitz *et al.* (2003b) controlled for OCD and depressive symptoms and they excluded those women who had received treatment in the past for either OCD or depression. The return rate on their questionnaires was 26 per cent ( $N = 156$ ). Sixty five per cent of these respondents indicated the presence of obsessional intrusive thoughts, similar to those found in patients with OCD. The most common themes of these thoughts included suffocation, accidents and intentional harm. As with the studies by Jennings *et al.* (1999) and Wisner *et al.* (1999) the design of this study

was a cross sectional mailed survey and as such, cannot control for response bias in those who returned the questionnaires. It could be argued that respondents were those parents who experienced these thoughts, but recognised them as senseless, not predictive of any disastrous consequences, therefore more comfortable with disclosure. Abramowitz *et al.* (2003a) suggest that non-responders (the majority) did not experience any thoughts, so presumed that the survey did not apply to them. However the reverse could also be true namely, that non-responders could find the experience of the thoughts so distressing that they did not respond. Either way the true number of parents experiencing these intrusions could be more or less than this study reports. There could also be gender differences between responders. Whatever the answer, prospective and more interview-based studies are required to control for response bias and also to provide a more rounded conceptualisation of the experience of these obsessions both before and after birth.

In summary the literature on pregnancy and mood disorder is varied and fairly inconclusive. Although prenatal anxiety seems to have a detrimental effect on birth outcomes, there is still a paucity of research on postnatal anxiety in non-psychiatric populations, specifically relating to pregnancy and birth and the effect this has on postpartum women without an identified anxiety disorder. Far more research has been carried out on mothers with OCD or PND or both. The mechanisms governing the relationship between symptoms in OCD and pregnancy related events have not yet been clarified. However it appears that the unpleasant intrusive obsessions experienced in OCD women are also present in those with PND and to an extent those women who experience dysphoria or anxiety symptoms during this period.

## **Predicting Postnatal Depression**

Postnatal depression affects approximately 13 per cent of childbearing women (O'Hara & Swain, 1996). Although episodes of PND are often short-lived (Cooper, Murray & Stein, 1991), research suggests that the effects of PND can be detrimental to both the mother and child (Murray, Fiori-Cowley, Hooper & Cooper, 1996; Stein, Gath, Butcher, Bond, Day & Cooper, 1991). In light of this research, studies have also focused on the importance of identifying predictive factors of PND, which enable clinicians to target early interventions to those mothers who need it most. Studies have mainly identified categories of predictor variable, which have strong predictive value and those variables that appear to be less powerful.

Depression and anxiety in pregnancy have been shown to be among the strongest predictors of PND. Prospective studies (Brugha, Sharp, Cooper, Weisender, Britto, Shinkwin, Sherrif & Kirwin, 1998; Gotlib, Whiffen, Wallace & Mount, 1991; Honey, Bennett & Morgan, 2003; Righetti-Veltema, Conne-Perreard, Bousquet & Manzano, 1998) have all concurred with this result, despite differences in diagnostic criteria and measures used to assess for depressive symptomatology. Righetti-Veltema *et al.* (1998) used an unselected sample of 570 women who were assessed for depressive symptoms by the same midwife during their third trimester of pregnancy and again at 3 months postpartum. Prenatal levels of depression were measured using the Hopkins Symptom Checklist (HSCL; Derogatis, Lipmann, Rickels, Uhlenhuth & Covi, 1974) and postnatally the women were assessed using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987).

Altogether 58, that is 10.2 per cent of the sample, were diagnosed as depressed mothers at the time of the second interview. Righetti-Veltema *et al.* (1998) did not analyse the predictive power of prenatal depression, so conclusions about how powerful prenatal depression is, cannot be concluded from the study. Cultural issues were raised by Righetti –Veltema *et al.* (1998), as the mothers with PND were more likely to originate from non-European countries. Patel, Rodriguez and De Souza (2002) have suggested that in specifically Asian cultures the gender of the infant may have a moderating effect on the level of depression experienced especially in first time mothers of Asian origin. Righetti-Veltma *et al.* (1998) do not explore issues around the gender of the infant in the non-European sample; neither do they separate race demographics enough for this to be examined.

The Leicester 500 Project (Brugha *et al.*, 1998) also examined pre and postnatal levels of depressive symptoms in a community sample of pregnant women at 3 time points, during pregnancy and at 3 and 12 months follow-up. To assess symptoms of depression they derived standardised depression subscales from a version of the General Health Questionnaire (Surtees & Miller, 1990) and used regression analyses to interpret their results. This analysis gives information regarding the accuracy of prediction. Brugha *et al.* (1998) report that the results in their study indicate that the sensitivity (women correctly identified as depressed) of their GHQ depressive subscales was 96 per cent and depressive symptoms during pregnancy were the strongest predictor when compared to other variables such as family and personal history of depressive illness. In Brugha *et al.*'s (1998) study only women in their first pregnancy were recruited and this represents a weakness in terms of generalisability.



In addition, the group of non-participants at follow up were more likely to be younger, unemployed or off sick from work, were more likely to have a history of psychiatric illness and an unplanned or unwanted pregnancy. These features are worth emphasising as they have been identified as antenatal predictors in previous studies (Kumar & Brockington, 1988).

The studies by Brugha *et al.* (1998) and Righetti *et al.* (1998) were included in a meta-analysis of 84 studies published in the 1990's, by Cheryl Beck (2001). This meta-analysis determined the magnitude of the relationship between postnatal depression and risk factors such as life stress, social support, prenatal depression and prenatal anxiety. The mean effect size indicator for prenatal depression was ( $r = .44$  to  $.46$ ) and prenatal anxiety ( $r = .41$  to  $.45$ ). This means that prenatal depression and prenatal anxiety are strong indicators of postnatal depression. Only four studies were used by Beck (2001) in the meta-analysis of prenatal anxiety as a predictor and unfortunately Beck (2001) does not identify these studies. However, Robertson, Grace, Wallington and Stewart (2004) also concluded that prenatal anxiety predicted postpartum depressive symptoms in their synthesis of recent literature. In a sample of the studies that are cited by Robertson *et al.* (2004), prenatal anxiety is variously measured in terms of anxious personality type (Johnstone, Boyce, Hickey, Morris-Yates & Harris, 2001), stress relating to future child care issues (Hayworth, Little, Carter, Raptopoulos, Priest & Sandler, 1980) and higher state and trait anxiety (Da Costa *et al.*, 2000). Unlike the literature on prenatal depression, those studies on prenatal anxiety measure conceptually different aspects of anxiety, which may affect the strength of prediction of this variable.



Marital relationship is also closely linked with findings on social support to be relevant in predicting depression after childbirth. Beck (2001) reports that a poor prenatal marital relationship is a significant, moderate predictor of postnatal depression in the meta-analysis of fourteen studies. This predictor variable shows a mean effect size of  $r = .39$ . Beck (2001) does not provide any details of how marital relationship was assessed in any of these studies. However, when individual articles were obtained, they varied from a large sample prospective analysis (Gotlib, Whiffen, Wallace, & Mount, 1991), to an unpublished doctoral dissertation (Lynch, 1996). In the study by Gotlib *et al.* (1991) a standardised scale (The Dyadic Adjustment Scale (DYAS; Spanier, 1976) measured marital distress in a sample of 703 women and found that women who became depressed reported lower levels of marital satisfaction prenatally. The study by Lynch (1996) was understandably much smaller ( $n = 79$ ), and focused specifically on interaction patterns and decision-making power between couples in primiparous<sup>2</sup> and multiparous<sup>3</sup> women. Lynch (1996) indicated that prenatally, perceived reduced decision-making power, increased conflict and lower levels of intimacy in their marital relationship were all predictors of postnatal depressive symptoms. There were differences in data collection between the two studies. The prenatal data collection in the study by Lynch (1996) covered a period of 16 weeks, and 2 pregnancy trimesters, whereas Gotlib *et al.* (1991) limited the range of prenatal data collection to the third trimester ( $> 29$  weeks gestation). This may be relevant as the time span between the 14 and 30<sup>th</sup> week of gestation, reflects greater changes in the pregnancy and may produce

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<sup>2</sup> Only one child

<sup>3</sup> More than one child

data that reflects that variance. This is less likely to occur in the study by Gotlib *et al.* (1991). A less variable range in time span would be expected to produce less variation in the data collected at that time point.

Other predictor variables have produced smaller or less robust results in the prediction of postnatal depression. Socio-economic factors such as unemployment, low income and low education have been cited as predictors in postnatal depression (Bernazzani, Saucier, David & Borgeat, 1997; Campbell & Cohn, 1991; Seguin, Potvin, St Denis & Loiselle, 1999). Beck (2001) reported a small but significant effect size (.19 - .22) of low socio-economic status as a predictor of postnatal depression. These small but reliable results appear to be consistent across different cultures and countries (Lee, Yip, Leung & Chung, 2000; Patel *et al.*, 2002). There are fewer studies that examine the influence of variables such as unplanned versus planned pregnancy and obstetric factors. An unplanned pregnancy was reported as having a small effect size (.14 to .17) when assessed by Beck (2001). One of the articles that Beck used in her study (Warner, Appleby, Whitton & Faragher, 1996) suggested that unplanned pregnancy was associated with EPDS scores over 12 in their sample of 2,375 participants. Although as Beck (2001) points out that an unplanned pregnancy does not necessarily equate to an unwanted pregnancy, the accidental nature of the pregnancy may result in ambivalence towards the child antenatally of lack of commitment to the infant, both of which have previously been associated with depression (Kumar & Robson, 1984).

The influence of obstetric factors may include pregnancy related complications such as preeclampsia or premature labour, as well as delivery related complications including excessive bleeding, instrumental delivery or caesarean section. Some large-scale studies (Johnstone *et al.*, 2001; O'Hara & Swain, 1996; Warner *et al.*, 1996) have indicated that obstetric complications have a small but significant effect on the development of postnatal depression. Robertson *et al.* (2004) note however that caution should be used when interpreting these results, as some of the variables may not be truly independent. For example the decision to perform a caesarean section may differ between hospitals and obstetricians. These studies (Johnstone *et al.*, 2001; O'Hara & Swain, 1996; Warner *et al.*, 1996) do not report the circumstances under which the decision to perform a caesarean section is made. Some caesarean sections are planned while others are performed under emergency and potentially traumatic circumstances.

In this current study prenatal anxiety and depressive symptoms will be assessed in the third trimester and so can be analysed as predictors for postnatal symptoms. Other demographics will also be collected and analysed for their predictive power.

### **Intrusions and Post-traumatic Stress Disorder in Childbirth**

The role of traumatic events in the aetiology of OCD and intrusive thoughts was discussed by De Silva and Marks (2001). They note that intrusive cognitions in OCD and Post-traumatic stress disorder (PTSD) have clear similarities. The thoughts unpredictably intrude into consciousness, they can be triggered by internal or external events are generally resisted and attempts to suppress them can have the

effect of increasing their frequency (Ehlers & Clark, 2000). The main difference between intrusions in OCD and PTSD is that intrusions in OCD tend to be senseless whereas intrusive cognitions in PTSD are often related to some re-experiencing of the traumatic event (Da Silva & Marks, 2001). Only recently has the definition of what constitutes a traumatic event been changed in the Diagnostic and Statistical Manual (DSM-IV; American Psychiatric Association, 1994) to include events such as traumatic childbirth. Previous editions of DSM (American Psychiatric Association, 1980; 1987) had defined a traumatic event as something outside the range of usual human experience, leading to confusion as to whether childbirth could be viewed as an appropriate stressor for PTSD onset (Ralph & Alexander, 1994).

Since this change in diagnostic criteria, researchers have sought to explore the prevalence of PTSD in childbirth and the associated symptoms that include the unwanted intrusions common in OCD (Ayers & Pickering, 2001; Ballard, Stanley & Brockington, 1995; Creedy, Shocket & Horsfall, 2000; Engelhard, Van Rij, Boullart, Ekhart, Spaanderman, Van den Hout & Peeters, 2002). Ayers and Pickering (2001) found a prevalence rate of 1.5 per cent in her prospective study of 289 women. The rate had decreased from 2.8 per cent at 6 weeks, highlighting the need for follow up time periods of at least 6 months to properly assess for PTSD symptoms. Ayers (2001) used the Minnesota Multiphasic Personality Inventory – Post-traumatic Stress Disorder Scale (Lyons, Keane & Keane, 1992) which is strongly related to PTSD symptoms such as intrusive memories and flashbacks (Watson, Juba, Anderson & Manifold, 1990). However, Ayers (2001) gives no details on the types of symptoms experienced by her participants.

Ballard *et al.* (1995) present 4 detailed case reports of women who developed PTSD commencing 48 hours after childbirth. All experienced some trauma during childbirth and subsequent PTSD symptoms that included not only reliving the experience that happened to them, but senseless intrusive thoughts and impulses unrelated to the actual event. One participant experienced the impulse to shake her baby, another had frequent intrusive thoughts of dead babies precipitated by seeing her own or other infants and one lady had a frequent thought of her healthy 9 month old baby, "white faced, wax-like, wrapped in a shroud." One of the women had family history of depression and self-esteem problems prior to the birth and another participant displayed some obsessional personality traits. Both these factors indicate a possible predisposition to developing PTSD (Ayers, 2003).

Creedy *et al.* (2000) found higher rates of PTSD (5.6 per cent) in their sample of primiparous and multiparous women. Unlike the study by Ayers and Pickering (2001), Creedy *et al.* (2000) had a shorter follow-up period of 6 weeks and did not assess for any past history of trauma, this may have inflated the results in their study. Creedy *et al.* (2001) provide some information regarding the incidence of intrusive thoughts unrelated to reliving the traumatic event in their study. Intrusive thoughts were experienced by 37.2 per cent of participants once a week and 28 per cent experienced intrusive thoughts 2-4 times a week (Creedy *et al.*, 2001).

Process characteristics of intrusive thoughts have also been researched in pregnancy related PTSD. Engelhard *et al.* (2002) measured the effect that suppression of the

intrusions had on PTSD symptoms in four groups of women, pre-eclampsia<sup>4</sup> preterm delivery, pre-eclampsia full term delivery, preterm delivery and normal birth. PTSD symptom severity was assessed in all four groups. Results show that PTSD criteria were met for 28 per cent of women who had preeclampsia and delivered pre term and 28 per cent of women without pre-eclampsia who delivered preterm. Severity of PTSD symptoms was significantly related to suppression of the thoughts as measured by the White Bear Suppression Inventory (Wegner & Zanakos, 1994). This finding is also evident in the literature on intrusions in OCD (Ehlers & Clark, 2000; Salkovskis, Shafran, Rachman & Freeston, 1999) and highlights how similar the intrusive thoughts are in both the PTSD and OCD populations.

Although this current study will not formally be measuring for PTSD in the participants, good clinical judgement at follow-up would recognise potential trauma symptoms in any women who incidentally report a particularly difficult birth. Should this occur, intrusive thoughts experienced in conjunction with trauma related symptoms can be assessed.

## **INTRUSIVE THOUGHTS IN NON-CLINICAL POPULATIONS**

### **Prevalence**

Rachman and De Silva's 1978 article on "abnormal and normal obsessions" was the first of its kind to suggest that the obsessional symptoms experienced by those suffering from OCD may be present in the general population. Rachman and De Silva (1978) gave a simple questionnaire to 124 students, inquiring whether they

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<sup>4</sup> Life threatening condition of high blood pressure during pregnancy

experienced intrusive unacceptable thoughts and impulses, their frequency and whether or not they could be dismissed. The questionnaire inquired about thoughts and impulses separately. The results of the study showed that 99 (79 per cent) reported that they had either thoughts or impulses. This total increases to 101 (84 per cent) if those subjects who experienced intrusive thoughts, but did not find them unacceptable were to be included. When Rachman and De Silva (1978) compared their normal obsessions in students to abnormal obsessions in obsessional patients, they discovered that the content of the thoughts were similar, i.e.; related to themes of sex and aggression. The authors conclude that despite the similarities of form and content in abnormal and normal obsessions, abnormal obsessions last longer, are more intense, more difficult to dismiss, produce more discomfort, are more frequent and are more strongly resisted.

Salkovskis and Harrison (1984) replicated the findings of Rachman and De Silva's 1978 study. They reported a prevalence rate of 88 per cent in their mixed sample of undergraduates and student nurses ( $n = 178$ ). Salkovskis and Harrison (1984) also further clarified the relationship between clinically relevant variables such as dismissability and frequency of normal obsessions. Their methodology was similar to that of Rachman and De Silva (1978) and they used the same questionnaire. In addition, a visual analogue scale (0-100) was used to rate how uncomfortable these thoughts made the participants feel. The relationship between frequency and dismissability and the discomfort ratings were then analysed. Their results indicated that dismissability showed the only true relationship. The people who found their intrusive thoughts hard to dismiss, rated their discomfort as being greater. Salkovskis



and Harrison (1984) report no relationship between discomfort and type or frequency of intrusion. Type referred to whether the intrusion was an image, thought or an impulse. Dismissability as a predictor of discomfort could be described as an expected result. It could be hypothesised that an intrusive thought that is difficult to get rid of, may cause more psychological discomfort as the very nature of its persistence denotes a significant, usually unpleasant meaning. Using a cognitive processing framework (Edwards & Dickerson, 1987a), the assumption is that unpleasant intrusions have a natural attentional priority and as such are subject to paradoxical effect (Frankl, 1960) when dismissal is attempted. The more that dismissal is directed to a thought that is naturally going to hold our attention, the more intense the thought becomes and the more difficult to dismiss. Ironically, for the thought to reduce in emotional intensity, it would be more beneficial to dwell in the intrusion and even elaborate on it.

### **Phenomenology of intrusive thoughts**

To know that these thoughts occur in the majority of the general population is useful for normalising purposes, especially for those subsections of the general population who may have more reason to worry about their occurrence. New mothers for example, might feel that experiencing these thoughts reflects negatively on their ability to be caring mothers, even though there is no evidence to suggest that these thought lead to actions. To discover more about obsessional thoughts, additional information is required to explore the essence of what elements make up what we know as an intrusive or obsessional thought.



Parkinson and Rachman (1981) had 60 non-psychiatric participants rate their intrusive cognitions along 12 dimensions, using 10-point rating scales. Performing a factor analysis on their data, they extracted 2 major factors, which described the structure of unwanted images. The first factor was Distressing Qualities (Intensity, Discomfort, Stress, Unpleasantness, Unacceptability, Anxiety and Torment) and the second was Controllability (Dismissal, Distraction, Resistance, Coping and Control). In addition their study also provides differential information regarding images, thoughts and impulses. Images, for example were found to be less acceptable than thoughts, but easier to dismiss and control; the subjects were more easily able to distract themselves from images than thoughts or impulses. These results were replicated by Salkovskis and Harrison (1984). In all forms of intrusion, the more difficult the intrusion was to dismiss, the more adverse reactions were experienced. However, as with Salkovskis and Harrison (1984), it was impossible to say whether the intrusions were difficult to dismiss because they were upsetting – or, that they are upsetting because they could not be dismissed. Parkinson and Rachman (1981) also addressed a similar question regarding the close relationship between intensity, a sub factor of distress, and controllability. They conclude that the direction of this association is less confusing as it would seem logical to conclude that a more intense intrusion would be more difficult to control. They reject the hypothesis that a more difficult to manage obsession becomes more intense, but in doing so, discount the theory of “thought suppression” (Wegner, 1994) that describes how thoughts become more intense the more the subject tries to prevent them from occurring. Clark and De Silva (1985) report that the difficulty with this study and with the study by Salkovskis and Harrison (1984), is that the variables the researchers were interested

in were the cognitive processes of the intrusions, rather than the content. They argue that this inference regarding the thought processes leads to an unreliable result. This argument has some merit because definitions of thought processes are more abstract and less easily defined than the content of the thoughts. Subjective reports of thought processes are highly individual by their very nature and are less easily replicated with a questionnaire format. However, Parkinson and Rachman (1981) made concerted efforts to familiarise their subjects who were mostly known to them, with the subject they were studying and only included those who had clearly defined intrusive thoughts at least twice a month. As content of the intrusions is a personal and highly subjective experience, Parkinson and Rachman (1981) did well to find commonalities in process among these thoughts.

Salkovskis (1985) debated the question whether intrusive thoughts are internal stimuli or responses to external stimuli, in his cognitive behavioural analysis of obsessional-compulsive problems. He compared cognitive intrusions with the negative automatic thoughts experienced by those people with depression. In comparison with negative automatic thoughts, obsessional thoughts intrude into the consciousness, are easily accessible, highly irrational, ego dystonic and attributed internally. Negative automatic thoughts tend to be related to established beliefs about oneself, less accessible and ego syntonic (Salkovskis, 1985, 1989). However he also suggested that obsessional intrusions could interact with negative automatic thoughts if the intrusions are assimilated into the person's belief system (e.g. "this is a very bad thing to be thinking") or activate pre-existing dysfunctional schema. This is consistent with the findings of Parkinson and Rachman (1981), who reported that for

normal subjects intrusions high on unacceptability were “worse in all respects” than intrusions of low unacceptability. Highly unacceptable intrusive activities were more distressing, produced more resistance, discomfort and stress, were more difficult to control and were subject to less distraction than intrusions low on unacceptability. Salkovskis (1985) concluded that there were enough differences in intrusions and negative automatic thoughts in psychiatric populations to conclude that intrusive thoughts were best regarded as cognitive stimuli rather than responses and that negative automatic thoughts were cognitive responses typically linked to dysfunctional beliefs. Parkinson and Rachman (1981) however did not reach the same conclusion in their non-clinical population. A surprisingly high number (56 per cent) of the intrusive images analysed were reported as being triggered by external events, as opposed to being described as internal and spontaneous. The externally triggered intrusions were also described as less anxiety provoking than the internal ones, although both were equal on measures of intensity, acceptability and controllability.

It is difficult to compare the two studies in this area, as Salkovskis (1985) was considering the experience of intrusions in conjunction with depressive thoughts and Parkinson and Rachman (1981) used a non-clinical population to analyse the content of their intrusions. It is possible that Salkovskis (1985) would also consider that intrusion could be cognitive responses when external events are considered to be the stimulus for the intrusion that in turn propagates the negative automatic thought.

## **Relationship with mood disturbance**

To understand the impact of intrusions in pregnant women and any potential relationship to levels of mood, it may be helpful to view this special population as a subset of the general population. With this in mind, this section will investigate the relationship between intrusions and mood disturbance in the general population. Normal obsessions do sometimes appear to exist in isolation from variations in mood; the fact that 80 per cent of the general population experience them (Rachman & Da Silva, 1978; Salkovskis & Harrison, 1984) with little or no emotional consequences is evidence of this. However, these intrusions are sometimes associated with a variation in mood, (Parkinson & Rachman, 1981; Sutherland, Newman & Rachman, 1982) even in the non-clinical population, either as a consequence or an antecedent of the cognitive intrusion.

## **Depression**

Individuals with OCD frequently experience additional psychopathology, including recurrent and major depressive episodes (Nestadt, Samuels, Riddle, Liang, Bienvenu, Hoehn, Grados & Cullen, 2001). The co-morbidity of the two conditions is so prevalent that some researchers have argued that OCD is in fact a disorder of depression rather than anxiety (Insel, Zahn & Murphy, 1985) In OCD samples, the occurrence of the obsessions in particular, appears to be linked more with low mood than the occurrence of the compulsive element of the disorder (Ricciardi & McNally, 1995) and there has been abundant evidence of the close relationship between obsessions and depression (Rachman & Hodgson, 1980). However, many of the studies have been retrospective clinical analyses, which preclude any firm

conclusions regarding the exact nature of the relationship between these two psychological variables. Clinical observation has noted that the onset of a depressive mood results in the increase in the occurrence of the obsessional activity and an increasing difficulty in the controllability of these obsessions.

Sutherland *et al.* (1982) tested the hypothesis that an experimentally induced dysphoric mood in a non-psychiatric population would render a pre-selected intrusive thought more difficult to dismiss. They used two conditions, statements and music, to induce both happy and sad states. They compared the thought removal times of intrusive and neutral thoughts under both the happy and sad conditions. Their hypothesis was supported; intrusive thoughts were more difficult to remove than neutral thoughts under both mood states and even more difficult to dismiss under a sad mood state when compared to the happy mood condition. Some technical issues are present with this study, such as the possibility of practice effects for the inducing and removing of intrusive thoughts, and priming during the music condition. Sutherland *et al.* (1982) indicate this was not a concern. In the dysphoric conditions the time taken to remove the intrusive thoughts was lengthy at the start and did not speed up with practice. Priming effects may have been a possibility but would have played such a small part in the experiment, that this effect would be unlikely to influence the overall results. The authors offer several explanations for the finding that negative intrusive thoughts were more difficult to dismiss under the sad mood state. They cite impaired cognitive control relating to learned helplessness, reduced cognitive access to pleasant thoughts, or that in a depressed mood the accessibility of positive information is decreased, while the access of negative

information is increased. All these accounts have some merit and have been subject to experimental investigation elsewhere (Seligman, 1975; Teasdale & Clark, 1981; Teasdale & Fogarty, 1979). Sutherland *et al.* (1982) used dismissal of the thoughts as a dependant variable, which although might indicate accessibility changes, the results could also be explained by difficulties in shifting attention away from the intrusive thought.

This proposal was investigated by Edwards and Dickerson (1987b). They hypothesised that the greater time taken to dismiss intrusive compared to neutral thoughts was better explained in terms of a decreased ability to disengage from the intrusive thoughts than a decreased ability to access a more pleasant replacement thought. They timed 43 psychology students whilst the subjects formed neutral and intrusive thoughts. Edwards and Dickerson (1987b) then timed the students whilst they formed three cognitive tasks. [a] Forming the first neutral thought, [b] forming the second neutral thought, [c] forming the intrusive thoughts and then replacing it with the neutral thought. The results confirmed their hypothesis that intrusive thoughts have significantly longer replacement times than neutral thoughts. However their study failed to confirm depression, as measured by the Profile of Mood States (McNair, Lorr & Droppleman, 1971), as a predictor of time take to replace the intrusive thought. This is at odds with the Sutherland *et al.* (1982) study, which found a relationship between dysphoria and intrusions. However, in their study, Sutherland *et al.* (1982) used a mood induction procedure to induce a low mood state, Edwards and Dickerson's (1987b) participants simply had a rating on a scale. The levels of depression in their group were not very high at all. Also Sutherland *et*

*al.*'s (1982) criterion for inclusion in the study was intrusive thoughts that were experienced for a minimum of twice a week, compared to Edwards and Dickerson (1987b) whose minimum experience of intrusions was set at one thought every fortnight. In addition to this their stringent inclusion criteria for negative thoughts, Sutherland *et al.* (1982) excluded participants who did not demonstrate a minimum mood change, in response to the statement or music. For Edwards and Dickerson (1987b) to conclude that depression was not predictive of intrusive thought replacement timings, the presence of a perceptible quantity of low mood is possibly required. Neither of these studies provided much information on the personal relevance of the thoughts that their subjects' were induced to generate. The personal relevance of the thought may be linked to environmental factors and therefore reduced in a laboratory setting.

Reynolds and Salkovskis (1991) substituted neutral for pleasant thoughts in their study of the effects of experimentally induced mood on positive and negative intrusive thoughts. In addition they used a self-monitoring paradigm to examine the frequency of naturally occurring-personally relevant intrusive thoughts. Their results indicated that positive and negative thoughts differ on a variety of dimensions and were differentially affected by elated or depressed mood. Although no significant differences were reported on *frequency* of negative thoughts, in comparison to the baseline condition, the depressed state subjects experienced almost a threefold rise in *discomfort* produced by the negative thought. The acceptability of the negative thought decreased under the depressed condition compared to baseline. Evidence also emerged from this study, which supported the notion of a reciprocal relationship



between low mood and intrusive thoughts (Teasdale, 1983). When asked to focus on negative intrusive thoughts, the subjects experienced a deterioration of mood. This presumably could be the beginning of a cycle of intrusions that are thought to be the precursors to clinical obsessions (Rachman, 1978). The depression leads to decreased acceptability, which results in attempts to suppress the thoughts which in turn has an impact on discomfort and mood and so on.

More recently, Reynolds and Brewin (1998) compared two matched samples, a psychiatric group (depression and post traumatic stress disorder) with a non-psychiatric group on imaginal versus verbal intrusions and thoughts versus memories. All three groups reported a wide variety of different types of intrusive cognition, both singly and in combination. This study examined the most prominent type of intrusive thought in the depression and PTSD groups. Both reported that thoughts were the most prominent intrusions. In light of the well-known visual flashbacks that PTSD patients experience this finding is perhaps unexpected. Another surprising result of this study was that the scores on the variable "depression" were higher in the PTSD group than the major depression group. This is probably explained by the fact that there were some co-morbid subjects in the PTSD group. The "depressed" groups responded differentially to the thoughts than the non-psychiatric controls. These groups were far more likely to evaluate the intrusion and by doing so assimilate it into something more akin to the negative automatic thought according to Beck's (1967) cognitive model. So depressive symptoms not only increase the frequency and unacceptability of intrusions, but also affect the way that the intrusion is responded to. The question of whether this



cognitive experience is then still an intrusive thought is less easily answerable. However, Turner, Beidal and Stanley (1992) argue that obsession and other negative thoughts, such as worry, are different processes. Intrusive thoughts, when compared to negative automatic thoughts, are ego dystonic. That is they are far removed from any version of events that we would associate with our belief system and ourselves. According to Salkovskis (1985; 1989) negative automatic thoughts are the opposite, ego syntonic. It seems most likely that the two cognitive events exist somewhere along a continuum rather than being discrete entities.

### Anxiety

The association between anxiety and intrusive thoughts appears to be less robust than would intuitively be presumed. This lack of consensus emerges from the ambiguous role that anxiety plays in the understanding of OCD. Reed (1985) reports that there is no convincing evidence that anxiety plays any substantial role in obsessive-compulsive disorders. While Reed (1985) states that obsessional patients often experience anxiety, it is more accurately related to long-term apprehension rather than to the immediate obsessional experience. This position is supported by Montgomery (1993), who presents a series of arguments for not classifying OCD as an anxiety disorder. Montgomery (1993) argues that while many OCD sufferers also have marked symptoms of anxiety, these are not present in all cases and their presence is not sufficient reason for categorising OCD as an anxiety disorder. In addition, some drugs thought to be anxiolytic have not been effective in treating OCD, whereas antidepressant serotonin reuptake inhibitors have had marked success in the amelioration of OCD symptoms (Bareggi *et al.*, 2004).

Unlike Montgomery (1993) and Reed (1985), Nestatdt *et al.* (2001) support the involvement of anxiety in OCD, by providing a familial aetiological explanation for the hypothesis. They examined the first-degree relatives of 80 OCD patients and 73 controls for presence of other anxiety disorders. Generalised anxiety disorder and agoraphobia were found to be more frequent in the relatives of those with OCD. For the relatives of the OCD probands who actually had OCD themselves, seasonal affective disorder, panic disorder and major recurrent depression were found to be the most commonly occurring conditions. The co-occurrence of depression in particular, was explained by Nestatdt *et al.* (2001) as being a direct psychological consequence of OCD. The association with anxiety disorders is consistent with data reported by Black, Goldstein, Noyles and Blum (1995), who suggested that there is an anxiety diathesis transmitted in the families of OCD probands. Although inconclusive, this study does suggest that for OCD patients, anxiety is involved via a common aetiological pathway. This explanation of the association of anxiety with intrusive thoughts is difficult to account for in non-clinical samples. Non-pathological anxiety is a common human experience and as such cannot really be described as having the any familial aetiology.

Rachman and De Silva (1978) first suggested that obsession found in non-clinical populations could be related to anxiety. They used “distress” to describe the feeling produced by obsessions, but explained this feeling using an anxiety framework. The intensity of the distress felt by the subjects decreases with habituation and that this is more easily achieved when they are under conditions of low arousal. For the subjects

to become more sensitive to the obsession significant meaning should be attributed to the obsessive thought or the subject should be highly aroused. This was the beginning of understanding the association of anxiety with intrusive thoughts and the presence of these thoughts in a non-clinical population.

In a series of studies investigating cognitive intrusions and various psychological variables, Freeston and colleagues found much to support the involvement of anxiety with obsessional thoughts. Freeston, Ladouceur, Thibodeau and Gagnon (1991) predicted that certain response styles would be important in the emotional experience of intrusive thoughts. They measured 125 students using the Cognitive Intrusions Questionnaire and also measures for anxiety, depression and compulsive activity. For those who experienced at least one intrusion described by the Cognitive Intrusions Questionnaire (99 per cent of the sample), the participant's responses to the intrusion were measured. Participants who made no effortful response to their intrusions experienced less worry, less sadness, less guilt and found the intrusion more easily dismissed than those who made a response to the intrusive thoughts. For those participants who made a response, the interaction between response strategy and emotional experience was significant, especially for the females of the group. Women who used a distraction technique experienced more anxiety than those women who employed an attending-thinking technique towards the intrusions. Anxiety levels were higher in both the response groups when compared to the no response group. In a replication and extension of this study, Freeston and Ladouceur (1993) argued that the use of either the attentive thinking or distraction strategies was related to the probability of the thoughts actually occurring and how much the

thought was disapproved of. Appraisal of high probability and low disapproval were associated with greater use of continued attention strategies, whereas appraisal of low probability and high disapproval were associated with greater use of distraction or escape strategies (Freeston & Ladouceur, 1993).

Langlois, Freeston and Ladouceur (2000a; 2000b) produced two studies, which examined more closely the association between intrusive thoughts and the process of worry in particular. These studies were precipitated in part by research that suggested that the symptoms of obsessions and worry were so similar that at least one measure, The Padua Inventory (Sanavio, 1988) couldn't distinguish them apart (Burns, Formea, Keortge & Sternberger, 1995). The study by Burns *et al.* (1995) resulted in a revision of this measure to distinguish between the two constructs. The differential factor that was revised was the content distinction between worry and obsessions as noted by Turner *et al.* (1992). The strong overlap between obsessions and worry would suggest a high rate of co-morbidity between GAD and OCD. However, studies report only a low rate of co-morbidity ranging from 0-13 per cent (Crino & Andrews, 1996). Other studies suggest a higher rate of co-morbidity. Abramowitz and Foa (1998) reported the co morbidity of GAD among people with OCD at 20 per cent. Langlois *et al.* (2000a; 2000b) in their two studies, set out to make direct comparisons between these two psychological symptoms. A large sample (N = 254) of students participated in the study. Without the experimenters making any distinction between worries and obsessions, each subject selected a thought from the worry list and a thought from the obsessions list. They then completed The Cognitive Intrusion Questionnaire (Freeston, Ladoucuer, Thibodeau

& Gagnon, 1992). Apart from thought content, several differences emerged between worry and obsessions. Worry tended to make people more worried. It was more voluntary than obsessions, more difficult to dismiss in the non-clinical sample and was more often expressed in verbal form whereas obsessions were more often experienced as images.

Encouraged that they had found distinctive characteristics in worries and obsessions, Langlois *et al.* (2000b) used a similar method to identify the differential appraisals of each thought and the factor structure for the strategies that were used to counter each type of thought. In an earlier study (Freeston *et al.*, 1991) they had investigated the responses to intrusions only. Langlois *et al.* (2000b) found that the most important factors associated with emotional response for worry were the intrusiveness of the worry and the degree to which the situation described in the thought was based on reality. For obsessional intrusions, negative emotions were simultaneously associated with the egodystonic nature, responsibility and the content of the thought. However the authors recognise that ego dystonicity and egosyntonicity are opposite ends of the same continuum of basis in reality. When a thought is egodystonic it is alien to the sense of self and the beliefs that the self holds. A thought that is egosyntonic is not alien and can be accommodated by our sense of self and the beliefs that are held. Therefore it was predictable that the basis in reality factor should emerge for both worries and obsessions, but at different ends of the continuum or the ego.

When Langlois *et al.* (2000b) analysed the factor structure of the coping strategies, predictably similarities and differences emerged between worries and obsessions.

The two factors identified were problem solving and escape avoidance. For obsessions, neutralisation and reassurance were grouped around the problem-focused factor. For worries, the processes of neutralisation and reassurance were grouped around the avoidance factor. As evidence indicates that worries are based in reality than obsessions (Clark & Claybourn, 1997; Langlois *et al.*, 2000a, 2000b) this result makes intuitive sense. Using reassurance instead of actively problem solving a worry might be seen as avoidance and less adaptive than trying to find a solution, which was a strategy loaded onto the problem-solving factor.

Langlois *et al.* (2000b) recognise that there are limits to these two studies. Firstly the use of the Cognitive Intrusions Questionnaire is problematic. The formal psychometric properties of this measure have not been established. Principally, there is no assessment of test-retest reliability of the items in the questionnaire. The use of non-clinical samples is also under scrutiny. Gibbs (1996) identified that selection criterion for analogue studies might make extrapolation from non-clinical to clinical subjects difficult. It is also impossible to determine the extent of sub clinical OCD in these samples. For the second study, item probability was identified as far more difficult to estimate in worries than it was in obsessions. Langlois *et al.* (2000b) note that the overestimation of negative events is a characteristic of clinically anxious people. Theirs may have been a non-clinical sample in appearance, but no screening instruments were used to check either for current emotional disorder or past psychiatric history.

So there appears to be very few differences between intrusions and mood in the general populations when compared to the subset of the general population being investigated in this current study. There appears to be evidence of a potential relationship between intrusions and low mood in the general population (Reynolds & Brewin, 1998; Reynolds & Salkovskis, 1981; Sutherland *et al.*, 1982) that reflects the association between these variables in pregnant women (Abramowitz *et al.*, 2003b; Jennings *et al.*, 1999). Although more contentious, the role of anxiety in the experience in intrusions has some evidence in the general population (Burns *et al.*, 1995; Freeston *et al.*, 1991; Langlois *et al.*, 2000a, 2000b). The importance for pregnant women however, appears to be related to the fact that intrusions are a component of OCD, which is conceptualised as an anxiety disorder. According to researchers (Buttolph & Holland, 1990; Maina *et al.*, 1999; Williams & Koran, 1997), this sample has an increased potential for developing of OCD.

## SUMMARY

It appears that there is much inconsistency in the research into pregnancy, mood disorder and the emotional experience of obsessions in normal populations. Conclusions regarding pregnancy and anxiety are limited as the research focuses on cross sectional studies of prenatal anxiety and birth outcomes. The conceptualisation of what constitutes antenatal stress/anxiety appears to be varied and either takes into account standardised measures of anxiety, psychiatric diagnosis, or daily hassles/stresses. However no study appears to account for all of these variables. The research available also illustrates a lack of standardised measure that could take pre



and post indices of anxiety specifically related to pregnancy and the changes that can occur throughout gestation.

There is a long tradition of research into OCD onset/worsening and the puerperium (Abramowitz *et al.*, 2003a; Buttolph & Holland, 1990; Maina *et al.*, 1999; Neziroglu *et al.*, 1992; Sichel *et al.* 1993a, 1993b; Williams & Koran, 1997). However much of the research is also subject to weaknesses. Most studies are retrospective and rely on self-report sometimes from many years ago (Buttolph & Holland, 1990; Sichel *et al.*, 1993a). Researchers sometimes fail to set criteria for a definition of onset or worsening of symptoms, but rely on subjective experience from their participants (Neziroglu *et al.*, 1992; Williams & Koran, 1997). It also appears that simply giving birth is not the only pregnancy related event that may be significant. Terminations of pregnancy, post pregnancy events and obstetric complications may also play a part in the changes in symptomatology (Neziroglu *et al.*, 1992). Some researchers in this area (Maina *et al.*, 1999) control for gender, other life events and limit how far back they wish the subjects to report about. These also show associations between symptom change and pregnancy related events, although the mechanisms of importance remain somewhat of a mystery. The more common content of the obsessions seems to be themes of contamination (Abramowitz *et al.*, 2003b). However, if the woman experiences concurrent symptoms of depression, the themes of the obsessive intrusions change to include obsessive thoughts about harming their infants.



When women with postnatal depression are compared with women with major depression unrelated to pregnancy, the nature of their obsessive symptoms changes (Wisner *et al.*, 1999). Comparable to what happens to the obsessive symptoms in pregnant OCD women, obsessions in postnatally depressed women change to become more aggressive towards their baby. Intrusions about harm coming to their infant are much higher in women with postnatal depression than in normal mothers (Jennings *et al.*, 1999).

Predicting postnatal depression has been the subject of much research. The strength of the prediction ranges from more powerful variables such as depression and anxiety during pregnancy (Brugha *et al.*, 1998; Gotlib *et al.*, 1991; Righetti-Veltma *et al.*, 1998), to predictive variables that although may be less statistically powerful, nevertheless have shown to be important in the prediction of PND. Those include marital relationship (Gotlib *et al.*, 1991), socio-economic factors (Bernazzani *et al.*, 1997; Campbell & Cohn, 1991) and obstetric factors (Johnstone *et al.*, 2001; O'Hara & Swain, 1996).

The importance of obstetric factors has been linked to the development of PTSD in childbirth and since changes were made in diagnostic criteria in the DSM IV (A.P.A. 1994), there has been more research in this area (Ayers, 2003; Ayers & Pickering, 2001, Ballard *et al.*, 1995). PTSD in general has many links with OCD in terms of symptom presentation (Da Silva & Marks, 2001). In particular, research has investigated intrusive thoughts in childbirth onset PTSD and found that including intrusive memories of the actual event, participants also experience senseless

intrusions similar to those found in OCD (Ballard *et al.*, 1995; Creedy *et al.*, 2000). Intrusive thoughts in PTSD are also subject to the same effects as intrusions in OCD, when attempts to process them are used (Engelhard *et al.*, 2002).

Obsessive intrusions in the general population have been shown to be highly prevalent and very similar to those found in the OCD population (Rachman & Da Silva, 1978; Salkovskis & Harrison, 1984). Similarities include content and form (thought, image, impulse). The crucial differences between normal and abnormal obsessions are that normal obsessions are easier to dismiss, easier to control and are less emotionally intense.

The literature on which emotion is the most important factor in the experience of these normal obsessions is without consensus, especially in both OCD (Insel *et al.*, 1985; Nestatdt *et al.*, 2001; Ricciardi & McNally, 1995) and normal populations (Freeston *et al.*, 1991; Parkinson & Rachman, 1981; Sutherland *et al.*, 1982). When the literature on depression and obsessive symptoms is considered, in patients with OCD there is high co-morbidity with depression and research seems to suggest that depression makes the obsessional component in OCD more prevalent, more difficult to control and more distressing (Ricciardi & McNally, 1995). However the exact mechanism of the relationship is undefined and probably reciprocal. In normal populations, lab induced dysphoria may ensure that obsessions are more difficult to control by making other cognitive stimuli more difficult to attend to (Edwards & Dickerson, 1987a). The difficulties with the lab research are that personal relevance

of the obsessions may be linked to the environment, so conclusions are difficult to make.

Anxiety research is even more contentious, with discussion about classification of OCD as an anxiety disorder, disputed in the literature (Montgomery, 1993; Reed, 1985). Again a high rate of co-morbidity suggests a role for anxiety in obsessive symptoms. Nevertheless, if antidepressants are more effective at controlling symptoms than anxiolytic medication, then anxiety may have less of a role than previously thought (Montgomery, 1993). There seems to be less controversy in examining the role of anxiety in normal samples that experience intrusive thoughts Burns *et al.*, 1995; Freeston *et al.*, 1991; Langlois *et al.*, 2000a, 2000b; Rachman & Da Silva, 1978). Studies indicate that more anxiety is evident in non-clinical samples who experience intrusions if the appraisal of the intrusion is significant or a response is made to the intrusive thought Freeston *et al.*, 1991; Freeston & Ladouceur, 1993). In particular the cognitive experience of obsessional thoughts has been likened to that of worry in a series of studies. The similarities have been so great that on occasion questionnaires have had difficulty telling them apart (Sanavio, 1988). This prompted research to distinguish between the two constructs and resulted in distinct characteristic being established (Clark & Claybourn, 1987; Langlois *et al.*, 2000a, 2000b; Rachman, 1985, 1989).

To conclude, anxiety levels appear to be elevated in pregnancy in non-clinical samples of women (Shear & Oommen-Mammen, 1995). In those women predisposed to obsessional symptoms, this period emerges as a susceptible time for

the symptoms of OCD to develop (Abramowitz *et al.*, 2000a). In the general population normal obsessions are common. Women during pregnancy and birth are a subsection of the normal population and as such will experience these intrusive thoughts. Low levels of anxiety and/or depression during this period may affect the experience of these thoughts. The emotional experience of the normal obsessions is complex and the literature on which emotion emerges as most prevalent is inconclusive (Montgomery, 1993; Nestadt *et al.*, 2001; Ricciardi & McNally, 1995).

## **AIMS AND HYPOTHESES**

This study aims to investigate the occurrence of intrusive thoughts and the characteristics of the thoughts in a community sample of women before and after they give birth. The hypotheses predict the association of the thoughts and their characteristics to levels of emotion before and after birth and the predictor variables of postnatal depressive symptoms.

### **Hypotheses**

- I. Intrusive thoughts with high emotional content will be positively correlated with the frequency, intensity and reduced dismissability of the thoughts.
- II. Those participants who experience intrusive thoughts and respond to them will experience higher levels of negative emotion, depression, anxiety and obsessionality, than those participants who have intrusive thoughts but do not respond to them.
- III. Those participants who experience intrusive thoughts and respond to them will experience them more frequently, intensely and find them more difficult to

dismiss than those who experience intrusive thoughts but did not respond to them.

- IV. Previous negative pregnancy experience and young maternal age will predict higher levels of postnatal anxiety and depressive symptoms.
- V. The levels of depression, anxiety and obsessionality prenatally will be correlated and predict the levels of these emotions postnatally.
- VI. Levels of depression, anxiety and obsessionality will be higher in the postnatal period.
- VII. The scores on the EPDS, STAI, MOCI and negative emotion will be positively correlated with each other.
- VIII. There will be a positive correlation between the scores on the EPDS, MOCI and STAI and the frequency, intensity and reduced dismissability of intrusive thoughts.
- IX. Those participants who experience intrusive thoughts will have higher levels of depression, anxiety and obsessionality than those participants who do not experience intrusive thoughts.

**ETHICS APPROVAL**

Application for ethics approval was sought from Lothian ethics committee in December 2003 and granted in January 2004. Particular consideration was given to the pregnant condition of the participants and how this may impact on the status of this group as potentially vulnerable. The ethics committee raised concerns specific to the nature and sensitivity of some of the questions being asked of the participants during the course of this study. In particular, the committee were concerned about the responsibility of the researcher to potentially act on some of the answers given by the participants. This matter was resolved by the implementation of referral procedures to ensure that any participants experiencing emotional distress during the course of the study were referred to the appropriate agency.

**DESIGN**

Previous research examining intrusive thoughts in new parents have used postnatal cross sectional designs (Abramowitz *et al.*, 2003b; Jennings *et al.*, 1999) to illicit these intrusive cognitions. Difficulties with this design include, self-selection onto the study of those parents who have experienced these thoughts possibly elevating the prevalence rates of intrusions in the study. Mailed surveys (Abramowitz *et al.*, 2003b), as well as semi-structured interviews (Jennings *et al.*, 1999) have also been used in research into this area. However, the subject matter examined can prove to be distressing. Whereas the anonymity of the survey may encourage parents to reveal intrusions they have experienced, any emotional distress also experienced is not addressed in a mailed survey. A semi-structured interview would provide the

opportunity of a two-way discussion to address any psychological concerns that were raised. Under these conditions, however, anonymity is waived and the parent may be less likely to divulge any upsetting thoughts due to fear of any negative consequences. Despite the lack of confidentiality, the latter design was chosen, as the emotional consideration of the participant was deemed more important than potential under reporting due to possible consequences. Despite the time constraints on this study, a prospective design was chosen, as the event of birth was fairly predictable. This allowed for test-retest considerations and also provided a baseline of all the measures, allowing for general comment on the effect of birth on low mood and anxiety. As this design was a within subjects design, no control group was required. The follow up time period of approximately 4 weeks was primarily determined by time constraints. However one prospective study by Leckman *et al.*, (1999) suggests that between the eighth month of pregnancy and up to 3 months post partum would be the timeframe to capture the peak period of intrusive preoccupation for parents.

## **RECRUITMENT**

With the cooperation of local midwives, the women in the study were recruited through their attendance at antenatal parenthood classes, both NHS and private. Prior to the programme commencing the researcher gave a two-minute address to the class as a whole about the nature of the research and gave each women an information sheet to read. The researcher returned the following week to recruit potential participants as they awaited the start of the programme. Initial contact was made with individual women at this point and a contact number was taken. Over the next couple

of days arrangements were made over the phone to visit each participants at their home for the antenatal questionnaires and semi-structured interview. Information regarding the involvement of participants in this study was sent to both their general practitioners and the participant's midwives. Demographic information included the expected date of delivery. At around the time of expected delivery each participant's midwife was contacted to ensure that follow-up postnatal measurement was appropriate. The criteria for exclusion at follow up would be a stillbirth or serious medical problem with either the mother or infant. The postnatal interview and questionnaires were repeated when the infant was approximately 4 weeks old.

## **PARTICIPANTS**

The majority of this community sample had no previous psychiatric history, although 3 women reported a past episode of depression. Two of the women sought counselling and one recovered without intervention. The participants consisted of predominantly white middle class university educated women in their mid 30's. The age of the sample ranged from 19 – 41 years (mean = 32.15 years; SD 4.54 years). Although 2 private antenatal classes were approached, the majority attended (n = 16) were NHS classes, in all areas of Edinburgh and East Lothian. In all, 130 women were contacted to participate. The majority of participants were recruited from the central Edinburgh area (n = 50; 90%) rather than East Lothian (n = 5; 10%). Fifty-five out of 130 women agreed to participate (42.3%). The drop out rate at the antenatal interview was only 12.7%, Out of the seven women who dropped out, only two decided against participating, the other five gave birth before they could be interviewed leaving an antenatal sample size of 48 women. Five participants were



excluded at the postnatal stage. One infant had a serious medical condition, one participant left the country, another suffered a family bereavement and two did not deliver in time to be included at the postnatal stage. This left a postnatal sample size of 43 participants.

## **MEASURES**

The questionnaires described below were chosen to measure sub-clinical levels of anxiety, depression and obsessional tendencies in the study sample. The semi-structured interview assessed the occurrence of the intrusive thoughts. All measures were administered ante and postnatally. A rationale is provided for the use of each.

### **Maudsley Obsessional Compulsive Inventory (MOCI; Hodgson & Rachman, 1977)**

To assess the presence of obsessional tendencies in the participants, one had to keep in mind that this sample was normal and to the researchers knowledge had no prior history of OCD. Therefore the requirements for the measure chosen were that it should not be too lengthy and should cover an easily identifiable set of items for the respondents to score. Three measures were considered. The Leyton Obsessional Inventory (LOI; Cooper & McNeil, 1968) was originally designed to assess for obsessionality in “house-proud housewives.” Standardisation of this measure on a non-clinical sample was an advantage, however, it contained too many items on cleanliness and tidiness and only three items for checking. This is a serious limitation as checking is one of the more common behaviours. In addition, the age of the

questionnaire meant that potential lifestyle issues might have interfered with the face validity of LOI.

The Yale-Brown Obsessive-compulsive Scale (YBOCS; Goodman, Price, Rasmussen, Mazure, Fleishmann *et al.*, 1989a; Goodman, Price, Rasmussen, Mazure, Delgado *et al.*, 1989b; Goodman, Rasmussen *et al.*, 1989c) is a semi-structured interview designed to assess symptom severity and response to treatment for patients diagnosed with OCD. Suitability for this sample was questionable due to the length of the measure and the in-depth nature of the questions for a sample without any psychiatric disorder.

The measure chosen was the MOCI, which was developed for assessing obsessional complaints that included an observable behaviour, both the psychiatric and normal populations. Four subscales were identified to classify these behaviours. [a] washing, [b] checking [c] slowness and [d] doubting. This measure does not cover all obsessional complaints, neither does it assess for obsessional personality traits. The format of the MOCI is a 30 item true-false response to statements describing the behaviours. The 4-week test-retest reliability of the MOCI total on a student sample (Hodgson & Rachman, 1977) produced a Kendell's tau of 0.8. The MOCI is also reliably able to distinguish between OCD patients and normal controls (Kraaijkamp, Emmelkamp & Van den Hout, 1986). Studies of non-clinical samples have yielded internal consistencies ranging from .40 to .62 (Chan, 1990; Sanavio & Vidotto, 1985). On student samples the MOCI has been used in assessment of cognitive intrusions (Reynolds & Salkovskis, 1991), however it demonstrates somewhat low

reliability on the structure of the subscales. The checking subscale explains 70 per cent of the variance on these non-clinical samples (Stoylen, Larson & Kvale, 2000). In this study, the participants were non psychiatric so only the total score of the MOCI was assessed.

### **The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden & Sagovsky, 1987)**

To assess for symptoms of low mood in the participants, two measures were considered, the Beck Depression Inventory (BDI-II; Beck, Steer & Brown, 1993) and the Edinburgh Postnatal Depression Scale (EPDS; Cox *et al.*, 1987). The BDI-II has shown to be a highly reliable and valid screening instrument for depression on psychiatric populations. However, the BDI-II has proven to have poor validity when applied on postnatal women (Harris, Huckle, Thomas & Johns *et al.*, 1989). Normal postnatal symptoms such as changes in appetite, sleep and loss of energy could easily be misconstrued as depressive symptomatology. The EPDS is a 10-item self-report scale specifically designed to screen for postnatal depression in the community. A study of 594 mothers (Dennis, 2004) completed the EPDS at 1,4 and 8 weeks postpartum. Results indicated that the EPDS showed satisfactory specificity and sensitivity at correctly classifying mothers at 8 weeks with and without postpartum depression.

### **State-trait Anxiety Inventory (Form Y) (STAI; Spielberger et al., 1983)**

To measure anxiety ante and postnatally, three measures were considered. A specifically designed measure for anxiety relating to pregnancy was developed by Levin (1991). This questionnaire gauged anxiety relating only to being pregnant and as such would not be suitable for the postnatal assessment of this sample. In addition the population on which this tool was standardised was largely African-American and Hispanic, cultural differences might have invalidated the items which covered anxieties relating to being pregnant, labour and being in hospital.

The Beck Anxiety Inventory (BAI; Beck & Steer, 1993) was also assessed for use in this study. This measure is a reliable and well-validated screen for general anxiety in clinical and non-clinical populations (Fydrich, Dowdall & Chambless, 1992). However the items in the BAI tended to focus primarily on the somatic symptoms of anxiety. During pregnancy especially the third trimester, women experience many physical sensations that would be attributable to pregnancy rather than symptoms of anxiety.

The state part of the STAI (Form Y) consists of 20 statements that evaluate how the respondents feel *right now*. The essential qualities evaluated by the state scale are feelings of apprehension, tension, nervousness and worry. It was developed for use with the non-clinical population and has been used in research to assess anxiety in pregnancy (Da Costa *et al.*, 1999; Leckman *et al.*, 1999; Rini, Dunkel-Schetter, Wadhwa & Sandman, 1999). Psychometric investigation has found this measure to be a reliable and valid tool for assessing anxiety that was both situational and related

to personality factors (Metzger, 1976; Rule & Traver, 1983; Spielberger *et al.*, 1983). For this study, only the state component of the measure was used (Form Y). Parkinson and Rachman (1981) suggest that intrusions are unrelated to personality factors and as this study was specifically concerned with the ante and postnatal period only, the partial use of this measure seemed reasonable.

### **Assessment of intrusive thoughts**

A pilot study was carried out to ascertain the optimum method for collecting information regarding the occurrence of the intrusions in the study sample.

#### Pilot study

The purpose of the pilot study was primarily to establish whether these cognitions were easily available to the women and the type of content that was present. In addition, information was required on the emotional experience of the thoughts for the participants. Eight women who were known to the author were contacted by telephone and given a cognitive interview. All had babies under the age of 3 months and closely matched the demographics of the sample in the study. The participants were white and had no history of psychiatric disorder. Six were professional, university educated women and for 7 of them this was their first baby. The mean age of this sample was 33.1 years and their ages ranged from 28-40 years. They were asked if they knew what intrusive thoughts were. All were unclear and required some information prior to deciding whether they had experienced any since the birth of their babies. Six out of eight (75 per cent) women decided that they had experienced intrusive thoughts since the birth of the infant and could describe the cognition

clearly. Four described images of harm coming to the infant, one woman experienced the verbal statement, “what if I drop her” and one participant described her intrusion as an impulse to drop her baby over the banister. To assess the emotional content of the intrusion in the pilot sample, the women were asked what emotions they experienced when the intrusive thought occurred. To assist them they were provided with a list and told that they could choose either one or as many emotions as they thought that they experienced. The list included:

ANGER      FEAR   SADNESS      DISTRESS      CONFUSION      WORRY  
 ANXIETY      SHAME      EMBARRASSMENT      GUILT  
 SHOCK      DISGUST

**Table1. Results of Intrusive thoughts pilot study**

Participant	Content of intrusion	Emotion experienced
CR	Image of mother putting baby into scalding bath.	guilt and fear
LN	Image of mother falling down the stairs with the baby.	worry and fear
JT	Impulse to drop the baby over the banister.	fear
SH	“what if I drop her”	worry
EW	None	none
KR	Image of a stranger stabbing the baby. in its pram.	fear
JW	Image of the baby’s head cracked and bleeding.	Guilt and worry
MB	none	none

The results of the pilot study led the methodology for assessment of the intrusive thoughts.

#### Presence of the thought

Due to the potentially sensitive nature of this area, a semi-structured interview was utilised. As the pilot study suggested participants might need some guidance as to the nature of these thoughts, the author initially presented the participant with some

information on the phenomenology of intrusions based on research available.

Characteristics of intrusions that were described included:

- Intrusive thoughts were unwanted, uncontrollable, unpleasant thoughts that could occur at any time of the day. They were very common in the general population (Rachman & De Silva, 1978; Salkovskis & Harrison, 1984)
- The unpleasant content of the thoughts often involved harm coming to someone, death, sexual themes and sometimes-unpleasant thoughts about contamination (Parkinson & Rachman, 1981; Rachman, 1978).
- The thoughts could appear in three forms. Verbal statements often starting with the words “what if....,” images of unpleasant scenes forming in the mind or even impulses to act in a way that the participant would never normally act (Rachman, 1981).
- It was explained to the participants that intrusive thoughts were not the same as general worries, that may be based around real life events that were occurring. Intrusions, unlike general worries could not be problem-solved, usually lasted for a brief amount of time and were involuntary (Clark & Claybourn, 1997; *Langlois et al.*, 2000b).
- The participants were provided with an explanation of the egodystonic nature of the thoughts. The thoughts were portrayed as being alien to the person’s values, beliefs and their sense of self (*Langlois et al.*, 2000a).

The participant and the author decided based on the above information, whether she had experienced anything similar to what was being described during the course of her pregnancy. If this was the case, then the thought/image/impulse described was noted. If the participant has experienced more than one intrusion, the most

commonly experienced thought was recorded. Previous research has provided a pre-prepared list of intrusions for their participants (Clark & De Silva, 1985; Freeston *et al.*, 1991; Niler & Beck, 1989; Rachman & De Silva 1978), with various degrees of specificity. However, the author decided against providing the participant with a prepared list, as the pilot study sample had been quite clear regarding the content of the thoughts they experienced.

#### Frequency of the thought

The frequency with which the intrusive thought occurs has been linked to the emotional reaction (Clark & De Silva, 1985) and dismissability and discomfort (Salkovskis & Harrison, 1984) produced by the intrusion in non-psychiatric samples. Frequencies of intrusive thoughts have been previously measured by Likert-type scales (Clark & De Silva, 1985; Salkovskis & Harrison, 1984). Salkovskis and Harrison (1984) used a 4-point scale for their non-clinical sample. The parameters for this frequency scale were; [1] less than 10 a month, [2] 10+/month, [3] 10+/week, [4] 10+/day. The frequency scale used by Clark and De Silva (1985) on the Distressing Thoughts Questionnaire (DTQ) was presented on 9-points, rated from 1 (never) through 5 (at least 2/month) to 9 (daily). The DTQ was unfortunately unavailable for use in this study or to confirm the exact frequency parameters between the numbers 1, 5 and 9. As both used specific numerical estimations rather than descriptive frequencies, the 4-point scale was chosen. When tested on the pilot sample, the higher frequency of 10+ intrusive thoughts per day was found to be excessive. As a result this fourth point was omitted from the frequency scale, leaving



the 4 point scale starting from [0] never, [1] less than 10 a month, [2] 10+/month, [3] 10+/week.

### Emotional content

Studies investigating the association of intrusions with different emotions have not reached a consensus regarding which emotion has the most influence on the intrusive thought *or* is most influenced by the intrusion. To decide which emotion to assess results from the pilot study and available research were taken into consideration.

*Anxiety:* The pilot sample reflected the presence of anxiety-based emotions (fear and worry) experienced during the intrusion. The participant who chose both worry and fear for her response was asked why she thought they were different. Her response indicted that worry had a more cognitive component to it than fear, which was felt more physiologically. The involvement of anxiety in intrusive thoughts replicates the research based on non-clinical samples (Clark & De Silva, 1985; Freeston *et al.*, 1991; Langlois *et al.*, 2000a; 2000b).

*Depression:* Although sadness was not identified as an experienced emotion in the pilot sample, studies have uncovered an association between depressive symptoms and intrusions in the normal population (Edwards & Dickerson, 1987; Ricciardi & McNally, 1995; Salkovskis, 1985). More significantly for this study, research has also suggested that postnatal depression is associated with the experience of intrusive thoughts (Jennings *et al.*, 1999) as well as sub-clinical levels of low mood in new mother without postnatal depression (Abramowitz *et al.*, 2003b).

As the experience of the thoughts was highly personal, it was felt that the participants in the main study should have the freedom to choose the emotion that they felt best fitted the experience of the intrusion, through the method chosen for the pilot sample. Therefore the list of emotions used for the pilot study was included in the semi-structured interview for the assessment of the intrusive thought.

#### Thought intensity

Research has suggested that the level of discomfort felt by the intensity of the intrusion may be related to other variables such as the frequency and dismissability of the intrusive cognition (Clark & De Silva, 1985; Parkinson & Rachman, 1981; Salkovskis & Harrison, 1984) and underlying levels of anxiety and depression (Clark & Hemsley, 1985; Freeston *et al.*, 1991). Thought intensity was rated on a 4-point scale from [0] didn't bother me [1] slightly intense [2] felt quite intense [3] very intense.

#### Thought dismissability

In line with the research quoted above, the ease of dismissability was also measured on a 4-point scale from [0] easy, [1] a bit difficult, [2] very difficult, [3] impossible.

#### Response to thought

The unpleasant content of intrusive thoughts sometimes provokes a reaction in the participant to help remove the thought. Freeston *et al.* (1991) suggested that

particular types of response were related to higher levels of emotional reaction and more effort in dismissing the thoughts. These responses included doing nothing, seeking reassurance, self-reassurance, behavioural distraction, replacing thought with another or other response. The participant's answers to the response question were included in the semi-structured interview.

## **PROCEDURE**

A couple of days after the participants had been recruited at the antenatal class; they were contacted by phone to arrange a home visit from the researcher. They were visited at a time of their convenience for the prenatal assessment. Initially the participant signed the three consent forms and filled out the standardised questionnaires and the demographic information sheet. These were administered in random order to prevent order effects; this was followed by the semi-structured interview for the intrusive thoughts. The participants were first given the information about the thoughts and asked to decide whether they thought they had experienced anything like these. If so they were asked the frequency, intensity and dismissability questions and asked to choose which negative emotions they had experienced from the list at the top of the interview sheet. When the assessment was complete, they were informed that their midwife would get a copy of their consent form and be informed of their involvement in the study. Their GP would also be informed but would not get a copy of the consent form. The date they were due to give birth was on the demographics sheet and they were told that the researcher would contact the midwife a week or so after that date, to check they had delivered and that a follow-up assessment was appropriate. When the researcher had confirmed the delivery date

with the midwife, the follow up would occur when the baby was approximately 4-6 weeks old. At this postnatal stage, the same assessments were administered apart from the consent forms and the demographics sheet.

## **STATISTICAL ANALYSIS**

This study is an exploratory analysis of different aspects of the experience of intrusive thoughts in community mothers. As such, it is not hypothesis driven in the same way as other studies might be and statistical analysis is not necessarily decided right at the beginning of the project. This was relevant when assessing for the power required to check for differences in variables in relation to the presence of the thoughts and also at the two different time points (pre and postnatal). ANOVA and Pearson  $r$  correlation coefficient were used to compare standardised measures against the group effect of thought presence or absence. A large power effect (.80) at significance of  $p < .05$  would require a sample size of 28 and 21 participants respectively (Cohen, 1992).

Usually scores from standardised tests are normally distributed. However despite the distribution nature of these types of scores generally, the standardised scores in this sample were not normally distributed. Because of this, both parametric and non-parametric statistical analyses were used to assess the results. More often than not there appeared to be no difference between the results using the different tests. This could be explained by the fact that although the distribution of the data was not bell curved, the data was certainly not distribution free and because the parametric tests

are assumed to be more robust than non-parametric these were used more often in the results (Howell, 1997).

**OVERVIEW OF RESULTS SECTION**

The principle aim of this section was to explore the data collected. The focus of the analysis for the intrusive thoughts will be some description and content analysis. Further analysis of the data from the intrusive thoughts interview will be investigated in relation to the standardised measures and the longitudinal data will be analysed for relationships between time 1 and time 2 measures and predictors of depressive symptoms postnatally. Usually the scores on measures of emotion are normally distributed in the general population. As such, the tradition in research is that parametric analysis is used for this type of data. As the results will show, there a question around how normal the distribution of this set of data actually is. Because of this, all the data was analysed using parametric and non-parametric statistics to check for differences. Parametric analysis was used, unless other wise stated, as the differences were found to be negligible and parametric analyses is known to be more robust than non parametric. All data analysis was conducted using the Statistical Package for the Social Sciences version 10 (SPSS).

**PARTICIPANT’S CHARACTERISTICS**

As indicated in Table 2, the typical participant was a white, professional, university educated married woman. She was expecting her first baby and had no previous history of miscarriages or terminations. Of the 47 participants in the sample, eighteen women had a history of a previous negative pregnancy experience (termination of pregnancy/miscarriage). The participants were aged between 19 and 41 years old (mean = 32.2 yrs, SD = 4.33 yrs) and all in their third trimester of pregnancy, between 29 and 40 weeks gestation (mean = 35.5 weeks, SD = 2.58 weeks).

**Table 2. Participant Demographic Characteristics**

Variable	Number (%)
Married/partner	43 (89.6)
Professional	32 (66.7)
University education	40 (83.3)
White	45 (93.8)
First child	45 (93.8)
No previous miscarriages	37 (77.1)
No previous terminations	41 (85.4)

**INTRUSIVE THOUGHTS INTERVIEW**

This section investigates the reliability of the items used to measure the frequency, intensity and dismissability of the participant’s intrusive thoughts. Cronbach’s alpha was the statistical analysis used to examine the internal reliability of these individual 3 items in the intrusive thoughts interview and to test whether or not the scales might be combined for their use as a single questionnaire, which could be used to compare pre and postnatal features of intrusive thoughts.

### Scale Analysis for Frequency, Intensity and Dismissability items

The reliability analysis using Cronbach's alpha indicated that all pre and postnatal items on the intrusive thoughts interview (Tables 3 & 4), indicated statistical reliability. The separate reliability coefficients for the prenatal scales and postnatal scales are .81 and .86 respectively. This compares well with the standard minimum for satisfactory reliability in a scale, usually taken to be 0.7 (Clark-Carter, 1997). Cronbach alpha usually requires a minimum of 4 items, though it can be calculated with three.

**Table 3: Correlation matrix for prenatal items of the Intrusive Thoughts Interview**

	Frequency (pre)	Intensity (pre)	Dismissability (pre)
Frequency (pre)	1.0000		
Intensity (pre)	.6200	1.0000	
Dismissability (pre)	.4766	.6637	1.0000
N of Cases = 48.0			
Reliability Coefficients 3 items			
Alpha = .8065      Standardized item alpha = .8099			

**Table 4: Correlation matrix for postnatal items of the Intrusive Thoughts Interview**

	Frequency (post)	Intensity (post)	Dismissability (post)
Frequency (post)	1.0000		
Intensity (post)	.8067	1.0000	
Dismissability (post)	.5288	.7426	1.0000
N of cases= 43			
Reliability Coefficients 3 items			
Alpha = .8577      Standardized item alpha = .8712			



## **Descriptive statistics for intrusive thought form and content**

The following data looks at how often the thoughts occurred and includes a content analysis of the types of themes that emerged and the form that they took.

### Prenatal Intrusive Thoughts

The incidence of antenatal intrusive thoughts was 71 per cent ( $n = 34$ ) of the mothers sampled. The most common intrusion was measured and this took one of three forms, either as a verbal statement, an image or an impulse to do something. The most common form of intrusive thought (40 per cent) appeared as a verbal statement. Images were less common (27 per cent) and impulses least common, with only 2 per cent of the sample experiencing these during the antenatal period. Content analysis showed that three content themes emerged with this sample. All were concerned with harm coming either to the baby, their spouse or themselves primarily and to the baby as a consequence. No themes involving contamination or unpleasant sexual content were reported. Examples of images of harm coming to the baby included pictures of the baby dead in utero, images of being stabbed in the stomach by a stranger or experiencing an image of the baby deformed in the womb. Common images and verbal intrusions of harm coming to the spouse included thoughts of “what if he dies in a car crash” and images of him bleeding to death on the street. The two impulses described were an impulse to throw something out of the window and an impulse to hit a friend’s child.

**Table 5: Form and content of antenatal intrusive thoughts**

	Number (%)			Example
	Verbal	Image	Impulse	
Harm to baby	11 (23)	7 (15)		"What if the baby is still born." Picture of the baby deformed in utero.
Harm to self	0	3 (6)		Picture of herself being stabbed in the stomach.
Harm to spouse	8 (17)	3 (6)		"What if he dies." Picture of spouse being stabbed in the street.
			2 (4)	To throw something out of the window. To hit her other child.
Total	19 (40)	13 (27)	2 (4)	
Valid number = 48		missing values = 0		

Postnatal Intrusive Thoughts

The postnatal incidence of intrusive thoughts was 60 per cent (n = 26). After the baby was born the content of the thoughts change to almost exclusively focus on harm coming to the infant (Table 6). The thoughts were categorized according to how the harm was inflicted in the content of the thoughts. Only one woman continued to experience verbal thoughts around the welfare of her husband who traveled a lot as part of his work. Twenty-five out of the 26 women reported thoughts of harm coming to their baby. Often they themselves were involved when harm occurred during these thoughts. For most women they experienced themselves involved in an accident with the baby. Dropping accidents were common for 11 (23 per cent) of the participants. Four of the women admitted that the harm inflicted in their thoughts was through their own agency. These women also described themes involving the baby falling, but their actions, in their intrusive thoughts had intent. One participant described a distressing impulse to throw the baby from the balcony outside her top flat front door. For ten of the women, the intrusive thoughts did not feature themselves harming the baby, but strangers and harm occurring with no agent involved. One participant described how she saw cars crashing into the sides of the pram while out walking. However, two women also reported disturbing thoughts of strangers sexually abusing their babies.

**Table 6: Form and content of postnatal thoughts**

	Number (%)			Example
	Verbal	Image	Impulse	
mother accident	2 (5)	9 (21)		"What if I drop him." Image of the baby with broken neck having been dropped down the stairs.
mother deliberate		3 (7)	1 (2)	Image of herself deliberately dropping the baby from a great height. Impulse to throw the infant from the balcony.
no agent		7 (16)		Image of a knife flying through the air and stabbing the infant.
others		1 (2)		Image of a car crashing into the side of the pram.
Sexual		2 (5)		Images of strange men sexually abusing the baby
Harm to spouse	1 (2)			"What if the plane crashes and he dies."
Total	3 (7)	22 (51)	1 (2)	
Valid Number = 43		missing values = 5		

**Concordance of pre and postnatal intrusive thoughts**

Pearson’s r analysis was used to examine the concordance of thought presence before and after birth. The results show that there were positive correlations between those women who experienced thoughts prenatally and those who had the thoughts after the baby was born ( $r = .663, p < .001$ , one-tailed).

**Table 7: Correlation of pre and postnatal intrusive thoughts presence**

		IT presence	IT post
IT presence (pre)	Pearson Correlation	1.000	.663**
	Sig. (1-tailed)	.	.000
	N	48	43
IT presence (post)	Pearson Correlation	.663**	1.000
	Sig. (1-tailed)	.000	.
	N	43	43

\*\* . Correlation is significant at the 0.01 level (1-tailed).

**Emotional Content of the intrusion**

To obtain a total negative emotion score the women chose as many emotions as they wished both pre and postnatally. The Kolmogorov-Smirnov test for normality indicated that the total negative emotion scores were not normally distributed,  $p < .001$  on both pre and post scores of negative emotion. Parametric and nonparametric analyses were used on the negative emotion data and indications were that there was no difference between the results. As a result, the data was treated as if it was normally distributed and parametric analysis was performed. As Table 9 reports, there were no significant differences between the total emotion scores pre or postnatally ( $t = 1.830$ ,  $df = 42$ ,  $p < .074$ , two-tailed), though the difference does approach significance with the prenatal scores being numerically higher.

**Table 8: Descriptive statistics of pre and postnatal total negative emotion scores**

	N	Minimum	Maximum	Mean	Std. Deviation
Post negative emotion	43	0	6	1.72	1.88
Pre negative emotion	48	0	7	2.08	1.70
Valid N (listwise)	43				

**Table 9: Paired Samples t- Test for negative emotions pre and postnatal score**

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error	Lower	Upper			
Pair 1	Post negative emotion -pre negative emotion	-.47	1.67	.25	-.98	1.79E-02	-1.830	42	.074

## Descriptive analysis of responses to thoughts

The descriptive analysis of the response to the thoughts is presented in Table 10. At the prenatal stage, 27 out of the 34 women (79 per cent) who experienced the thoughts responded to them. The percentage was slightly lower postnatally (65 per cent). The type of responses that were made to the thoughts did not change between the pre and postnatal period. The most common response was a thinking reaction, often either to reassure herself that the thought was a silly thought to have, or to try and rationalise the probability of the thoughts actually occurring. Distraction responses were usually behavioural. Either to hold the baby tighter (especially if the thought contained dropping themes), or sometimes the participant would leave the room that she had the thought in or switch on the television.

**Table 10: Pre and postnatal frequencies of response in those women who experienced intrusive thoughts.**

	Prenatal (%)	Postnatal (%)	Example
Thought attentively	15 (43)	10 (38)	"told myself it would never happen"
Distraction	8 (24)	2 (8)	"I went to the kitchen to make a cup of tea"
Other	4 (12)	5 (19)	"I told my husband about the thought and he reassured me"
No response	7 (21)	9 (35)	
Total	34 (100)	26 (100)	

**Hypothesis I: Intrusive thoughts with high emotional content will be positively correlated with the frequency, intensity and reduced dismissability of the thoughts.**

Each emotion that was chosen by the participants was scored 1, and then they were added to give a total negative emotion score. This section uses Pearson’s r correlation coefficient to examine the relationship between the negative emotion score and each of the characteristics of the intrusive interview scale.

Prenatal Results

Table 11 shows there was a significant positive correlation between total negative emotion and frequency ( $r = .646, p < .001$ , one-tailed), intensity ( $r = .755, p < .001$ , one-tailed), and dismissability ( $r = .492, p < .001$ , one-tailed). The higher the prenatal negative emotion, the more frequent and intense the thoughts and the more difficult they were to dismiss.

**Table 11: Correlations between prenatal scores of negative emotion and frequency, intensity and dismissability of intrusive thoughts.**

		Negative emotion score	ITS frequency pre	ITS intensity pre	ITS dismissability pre
Negative emotion score	Pearson Correlation	1.000	.646**	.755**	.492**
	Sig. (1-tailed)	.	.000	.000	.000
	N	48	48	48	48
ITS frequency pre	Pearson Correlation	.646**	1.000	.620**	.477**
	Sig. (1-tailed)	.000	.	.000	.000
	N	48	48	48	48
ITS intensity pre	Pearson Correlation	.755**	.620**	1.000	.664**
	Sig. (1-tailed)	.000	.000	.	.000
	N	48	48	48	48
ITS dismissability pre	Pearson Correlation	.492**	.477**	.664**	1.000
	Sig. (1-tailed)	.000	.000	.000	.
	N	48	48	48	48

\*\* . Correlation is significant at the 0.01 level (1-tailed).

Postnatal Results

When the relationship between the postnatal negative sores and scale characteristics was explored (Table 12), a similar pattern emerged. There were positive correlations between negative emotion and frequency ( $r = .646, p < .001$ , one-tailed), intensity ( $r = .755, p < .001$ , one-tailed) and dismissability of the intrusive thoughts ( $r = .492, p < .001$ , one-tailed). The alternative hypothesis was supported at both the pre and postnatal stage.

**Table 12: Correlations between postnatal scores of negative emotion and frequency, intensity and dismissability of intrusive thoughts**

		ITS frequency post	ITS intensity post	ITS dismissability post	Negative emotion score
ITS frequency post	Pearson Correlation	1.000	.807**	.529**	.707**
	Sig. (1-tailed)	.	.000	.000	.000
	N	43	43	43	43
ITS intensity post	Pearson Correlation	.807**	1.000	.743**	.793**
	Sig. (1-tailed)	.000	.	.000	.000
	N	43	43	43	43
ITS dismissability post	Pearson Correlation	.529**	.743**	1.000	.696**
	Sig. (1-tailed)	.000	.000	.	.000
	N	43	43	43	43
Negative emotion score	Pearson Correlation	.707**	.793**	.696**	1.000
	Sig. (1-tailed)	.000	.000	.000	.
	N	43	43	43	43

\*\* . Correlation is significant at the 0.01 level (1-tailed).

**Hypothesis II: Those participants who experience intrusive thoughts and respond to them will experience higher levels of negative emotion, depression, anxiety and obsessionality, than those participants who have intrusive thoughts but do not respond to them.**

A comparison of levels of negative emotion, anxiety, depression and obsessionality was made between those women who did and did not respond to the thoughts. A one-way between subjects ANOVA analysed the group effect of responding to the intrusive thoughts.

#### Prenatal Results

The results indicate that there were no significant effects of thought response on negative emotion ( $F(1,32) = 2.629, p = .115$ ), depression ( $F(1,32) = 1.575, p = .219$ ), state anxiety ( $F(1,32) = 1.576, p = .218$ ), or obsessional behaviour ( $F(1,32) = .271, p = .606$ ).

#### Postnatal Results

No effect of response was found on any of the measures at the postnatal stage. No significant differences were found in levels of anxiety ( $F(1,24) = 3.631, p = .069$ ), total negative emotion scores ( $F(1,24) = 1.407, p = .247$ ), Depression scores ( $F(1,24) = 2.407, p = .134$ ), or scores of obsessional behavior ( $F(1,24) = .434, p = .516$ ). The alternative hypothesis was not supported at any stage.



**Hypothesis III: Those participants who experience intrusive thoughts and respond to them will experience them more frequently, intensely and find them more difficult to dismiss than those who experience intrusive thoughts but do not respond to them.**

A between subjects one-way ANOVA was used to analyze the data. No discernable differences were noted when non-parametric statistics (Kruskall Wallis) examined these data, so the results of the parametric statistics have been utilized.

Prenatal Results

Participants who responded to the thoughts experienced more intensity/discomfort ( $F(1,32) = 4.933, p < .05, \eta^2 = .134$ ) as shown in Table 13 and found the thoughts more difficult to dismiss ( $F(1,32) = 10.122, p < .01, \eta^2 = .248$ ) than those participants who did not respond to the thoughts (Table 14). The group effect of thought response made no difference to the frequency of the thoughts ( $F(1,32) = 2.150, p = .152$ ). The alternative hypothesis was supported for intensity and dismissability of the thoughts but not for thoughts frequency.

**Table 13: One-way ANOVA of prenatal response group effect on thought intensity**

Dependent Variable: ITS intensity pre						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2.204 <sup>a</sup>	1	2.204	4.933	.034	.134
Intercept	38.439	1	38.439	86.040	.000	.729
Response (pre)	2.204	1	2.204	4.933	.034	.134
Error	14.296	32	.447			
Total	93.000	34				
Corrected Total	16.500	33				

a. R Squared = .134 (Adjusted R Squared = .106)

**Table 14: One-way ANOVA of prenatal response group effect on thought dismissability**

Dependent Variable: ITS dismissability pre

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	3.739 <sup>a</sup>	1	3.739	10.122	.003	.240
Intercept	6.798	1	6.798	18.403	.000	.365
Response (pre)	3.739	1	3.739	10.122	.003	.240
Error	11.820	32	.369			
Total	37.000	34				
Corrected Total	15.559	33				

a. R Squared = .240 (Adjusted R Squared = .217)

Postnatal Results

The postnatal results replicated those found prenatally. Thought frequency was not affected by response ( $F(1,24) = .260, p = .615$ ). However, as Tables 15 and 16 indicate those women who responded to the thoughts experienced them more intensely ( $F(1,24) = 5.111, p < .05, \eta^2 = .176$ ) and found them more difficult to dismiss ( $F(1,24) = 9.417, p < .01, \eta^2 = .282$ ). Postnatally, the same alternative hypothesis was partially supported.

**Table 15: One-way ANOVA of postnatal response group effect on thought intensity**

Dependent Variable: ITS intensity post

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	3.680 <sup>a</sup>	1	3.680	5.111	.033	.176
Intercept	79.680	1	79.680	110.661	.000	.822
POSTRES2	3.680	1	3.680	5.111	.033	.176
Error	17.281	24	.720			
Total	121.000	26				
Corrected Total	20.962	25				

a. R Squared = .176 (Adjusted R Squared = .141)

**Table 16: One-way ANOVA of postnatal response group effect on thought dismissability**

Dependent Variable: ITS dismissability post

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	4.119 <sup>a</sup>	1	4.119	9.417	.005	.282
Intercept	9.657	1	9.657	22.080	.000	.479
POSTRES2	4.119	1	4.119	9.417	.005	.282
Error	10.497	24	.437			
Total	30.000	26				
Corrected Total	14.615	25				

a. R Squared = .282 (Adjusted R Squared = .252)

# STANDARDISED MEASURES

## Tests of normality

The data were examined for departure from the normal distribution. The Kolmogorov-Smirnov and Shapiro-Wilk statistics were used on all standardised measures. Table 17 indicates the results from the Shapiro-Wilk statistics were significant on all measures to the level  $p < .02$ . The results from the Kolmogorov-Smirnov statistic also confirm that the data from the pre EPDS ( $K-S = .189, p < .001$ ) and MOCI ( $K-S = .230, p < .000$ ) and the post MOCI ( $K-S = .218, p < .000$ ) do depart from an ideal normal distribution. However, only the pre and post MOCI showed an extreme statistical significance which be considered to be deviant from normal distribution in the general population (Clark-Carter, 1997).

**Table 17. Tests of normality for all pre and post standardised measures**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Edinburgh PND scale	.189	43	.001	.921	43	.010**
Maudsley OC pre	.230	43	.000	.729	43	.010**
State/Trait Inventory (State)	.126	43	.082	.902	43	.010**
Edinburgh Scale	.114	43	.192	.929	43	.017
Maudsley O-C Total	.218	43	.000	.813	43	.010**
State/Trait Inventory (State)	.127	43	.078	.882	43	.010**

\*\* . This is an upper bound of the true

a. Lilliefors Significance

Table 18 describes the kurtosis and skewdness of the data for the standardised measures. If skewdness and kurtosis are more than twice the standard error then this suggests that the data is skewed. Without doubt, the data for the pre and post MOCI (pre: skewdness = 2.98, Std. error = .34; kurtosis = 12.62, Std. error = .67; post:

skewness = 2.02, Std. error = .36; kurtosis = 6.09, Std. error = .70) is skewed, as is the data for the pre STAI (skewness = 1.04, Std error = .34). In fact most of the data appears to be skewed in the direction of the positive. The only non-significant results were that of the pre EPDS (skewness = .65, Std. error = .34, kurtosis = -.276, Std. error = .67). Despite this significance, data from all these measures have previously been treated as normally distributed in other studies (MOCI; Hodgson & Rachman, 1977; Reynolds & Salkovskis, 1991; EPDS; Cox *et al.*, 1987; Cox *et al.*, 1993; STAI; Heron *et al.*, 2003; Spielberger *et al.*, 1970) and in these studies, has not been subject to non-parametric statistics. In light of this, parametric analysis was used through the results.

**Table 18. Skewness and Kurtosis of all pre and post standardised measures.**

	N	Mean	Std. Dev	Skewness		Kurtosis	
				Statistic	se	Statistic	se
Edinburgh PND pre	48	4.8	3.5	.65	.34	-.276	.67
Maudsley OC pre	48	3.6	3.4	2.98	.34	12.62	.67
State/Trait Inventory (State) pre	48	29.3	7.6	1.04	.34	.58	.67
Edinburgh PNDS post	43	6.1	4.4	1.05	.36	2.20	.70
Maudsley O-C post	43	4.1	4.0	2.02	.36	6.09	.70
State/Trait Inventory (State) post	43	30.8	9.5	1.13	.36	.92	.70
Valid N	43						

## Pre and postnatal scores and their comparison to other samples.

Table 19 and 20 illustrate the mean, median, standard deviation and ranges of the prenatal and postnatal scores on the standardised measures used. Three women reported a past history of one episode of depression for which one person sought therapy. Other than that, the sample had no history of psychiatric disorder.

**Table 19. Prenatal scores for standardized measures.**

	Mean	Median	SD	Range
Edinburgh Postnatal Depression Scale	4.88	3.50	3.55	0-15
Maudsley Obsessive-Compulsive Inventory	3.65	3.00	3.48	0-21
State/Trait Anxiety Inventory (Form Y)	29.31	28.00	7.66	20-52

**Table 20. Postnatal scores for standardized measures.**

	Mean	Median	SD	Range
Edinburgh Postnatal Depression Scale	6.16	5.00	4.49	0-22
Maudsley Obsessive-Compulsive Inventory	4.16	3.00	4.02	0-21
State/Trait Anxiety Inventory (Form Y)	30.86	29.00	9.53	20-57

The mean and median scores on the EPDS, STAI and MOCI indicate that the group as a whole did not experience high levels of low mood, anxiety or obsessional behaviour when compared to clinical populations (Table 21). The women in this sample show lower levels of all symptoms than any of the non-clinical populations they were compared against.

**Table 21. Comparison of sample scores and normative data on standardised scores.**

	Sample mean	Clinical Pre and (post)population mean	Non-clinical population mean
Edinburgh Postnatal Depression Scale	4.88 (6.16)	16.5*	7.30*
Maudsley Obsessive-Compulsive Inventory	3.65 (4.16)	18.86**	4.50**
State/Trait Anxiety Inventory (Form Y)	29.31 (30.86)	49.02***	36.17***

\* Compared to depressed and non-depressed postpartum women (Cox *et al.*, 1987)

\*\*Compared to obsessional patients and undergraduates aged 20-35 yrs. (Hodgson & Rachman, 1977; Stoylen *et al.*, 2000).

\*\*\*Compared to male neuropsychiatric patients and women aged 19-39 yrs. (Spielberger *et al.*, 1983).

## **Longitudinal examination of the standardised measures**

**Hypothesis IV: Previous negative pregnancy experience and young maternal age will predict higher levels of postnatal anxiety and depressive symptoms.**

The results of Table 22 indicate that there is a significant and inverse relationship between maternal age and postnatal anxiety ( $r = -.415, p < 0.01$ , 2-tailed) and maternal age and postnatal depressive symptoms ( $r = .334, p < .05$ ). Previous negative experiences were not correlated with any of the postnatal measures.

Prenatal standardised scores of the EPDS, STAI, MOCI, the total negative emotion scores, previous negative pregnancy experience and maternal age were entered into a Stepwise regression analysis to predict postnatal EPDS score. The resulting model did not include the MOCI, the STAI, the prenatal negative emotion score, nor previous negative pregnancy experience, but did include prenatal EPDS and maternal age as significant predictors (see Table 23). Prenatal EPDS accounted for 31 per cent of the variance (Adjusted  $R^2 = 0.319$ ). The inclusion of maternal age into the model resulted in an additional 11% of the variance being explained ( $R^2$  change = 0.114). In total, prenatal EPDS and maternal age account for 42 per cent of the variance (Adjusted  $R^2 = 0.421$ ). Prenatal standardised scores of the EPDS, STAI, MOCI, the total negative emotion scores, previous negative pregnancy experience and maternal age were entered into a Stepwise regression analysis to predict postnatal STAI score. Prenatal EPDS and maternal age predicted postnatal STAI score. Prenatal STAI was not included in the stepwise model, as it accounted for no more of the variance ( $t = 1.558, p = .127$ ). Prenatal EPDS accounted for 19 per cent of the variance (Adjusted  $R^2 = 0.193$ ) in postnatal STAI scores, when maternal age was added into the model, this added another 17 per cent ( $R^2$  change = 0.174) of the variance explained. As

prenatal STAI had previously indicated a correlation to postnatal STAI (Table 22), prenatal STAI was examined as a single predictor variable for postnatal STAI. This was examined using the enter method of regression analysis. As a single predictor, prenatal STAI accounted for only 18 per cent of the variance in postnatal STAI scores (Adjusted  $R^2 = 0.176$ ). Therefore when predicting postnatal anxiety, prenatal anxiety is a relevant predictor in the absence of prenatal depressive symptoms and a young maternal age. When prenatal depressive symptoms and a young maternal age are both present, these seem to predict postnatal anxiety better than prenatal anxiety. In the final model (Table 24) prenatal EPDS and maternal age account for 36 per cent of the variance of scores in the postnatal STAI. It appears that the best predictor for postnatal anxiety and depressive symptoms is prenatal depressive symptoms and a young maternal age. This partially supports the alternative hypothesis.

**Table 22: Correlations between the pre and post standardised measures, maternal age and previous negative pregnancy experiences**

		age	prevneg	epdspre	staipre	mocipre	emotpre
epdspost	Pearson						
	Correlation	-.334*	.067	.579**	.379*	.292	.310*
staipost	Sig (2-tailed)	.029	.668	.000	.012	.057	.043
	Pearson						
staipost	Correlation	-.415**	-.140	.461**	.443**	.302*	.409**
	Sig (2-tailed)	.006	.370	.002	.003	.049	.006
mocipost	Pearson						
	Correlation	-.293	-.077	.443**	.419**	.900**	.126
emotpost	Sig (2-tailed)	.056	.624	.003	.005	.000	.420
	Pearson						
emotpost	Correlation	-.058	-.193	.404**	.317*	.170	.575**
	Sig (2-tailed)	.711	.214	.007	.038	.277	.000

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).



**Table 23: Stepwise regression analysis for prenatal EPDS and maternal age to predict postnatal EPDS score.**

Variables	R square	Adjusted R <sup>2</sup>	Change statistics				
			R <sup>2</sup> change	F change	df1	df2	Sig.
EPDS	.335 <sup>1</sup>	.319	.335	20.671	1	41	.000
EPDS,age	.449 <sup>2</sup>	.421	.114	8.235	1	40	.007

<sup>1</sup> Predictors: (Constant), Edinburgh PND scale pre

<sup>2</sup> Predictors: (Constant), Edinburgh PND scale pre, maternal age

**Table 24: Stepwise regression analysis for prenatal EPDS and maternal age to predict postnatal STAI score.**

Variables	R square	Adjusted R <sup>2</sup>	Change statistics				
			R <sup>2</sup> change	F change	df1	df2	Sig.
EPDS	.212 <sup>1</sup>	.193	.212	11.035	1	41	.002
EPDS,age	.386 <sup>2</sup>	.355	.174	11.342	1	40	.002

<sup>1</sup> Predictors: (Constant), Edinburgh PND scale pre

<sup>2</sup> Predictors: (Constant), Edinburgh PND scale pre, maternal age

**Hypothesis V: The levels of depression, anxiety and obsessionality prenatally will be correlated with, and predict the levels of these emotions postnatally.**

Table 22 indicates a significant positive relationship is found between EPDS scores pre and postnatally ( $r = .579, p < 0.01$ , 2-tailed). Prenatal scores in the EPDS are also correlated with postnatal scores on the STAI ( $r = .461, p < 0.01$ , 2-tailed), the MOCI ( $r = .443, p < 0.01$ , 2-tailed) and the negative emotion score ( $r = .404, p < 0.01$ , 2-tailed). The prenatal scores on the STAI are significantly correlated with the postnatal scores on the EPDS ( $r = .379, p < 0.05$ , 2-tailed), the STAI ( $r = .443, p < 0.01$ , 2-tailed), the MOCI ( $r = .419, p < 0.01$ , 2-tailed) and the negative emotion score ( $r = .317, p < 0.05$ , 2-tailed). Prenatal negative emotion scores were significantly correlated with postnatal scores on the EPDS ( $r = .310, p < 0.05$ , 2-tailed), the STAI ( $r = .409, p < .006$ , 2-tailed), and negative emotion ( $r = .575, p < .000$ , 2-tailed).

### Predictors of postnatal MOCI score

Prenatal scores on the MOCI, EPDS, STAI, negative emotion and previous negative pregnancy experience and maternal age were entered into a stepwise regression model to predict postnatal MOCI scores. The only significant predictor of postnatal MOCI score was prenatal MOCI score (Table 25), which accounted for 81 per cent (Adjusted  $R^2 = 0.806$ ) of the variance. Prenatal EPDS, STAI, negative emotion, negative pregnancy experience and maternal age were not included in the model. When predicting postnatal obsessive behaviour, prenatal obsessive behaviour is the only significant predictor.

**Table 25: Stepwise regression analysis for prenatal MOCI score to predict postnatal MOCI score.**

Variables	R square	Adjusted $R^2$	Change statistics				
			$R^2$ change	F change	df1	df2	Sig.
MOCI pre	.811 <sup>1</sup>	.806	.811	175.745	1	41	.000

<sup>1</sup> Predictors: (Constant), MOCI pre

### Predictors of postnatal negative emotion

Prenatal EPDS, STAI, MOCI, negative emotion, previous negative pregnancy experience and maternal age were entered into a stepwise regression analysis to predict postnatal negative emotion. Prenatal EPDS, MOCI, STAI, previous negative pregnancy experience and maternal age were not included in the model. Prenatal negative emotion was the only predictor of postnatal negative emotion (Table 26). Prenatal negative emotion accounted for 31 per cent of the variance (Adjusted  $R^2 = 0.314$ ). Prenatal level of negative emotion is the only important predictor of postnatal

level of negative emotion. Hypothesis V was supported, each prenatal measure was correlated with and predicted the postnatal measure.

**Table 26: Stepwise regression analysis for prenatal negative emotion score to predict postnatal negative emotion score.**

Variables	R square	Adjusted R <sup>2</sup>	R <sup>2</sup> change	Change statistics			
				F change	df1	df2	Sig.
Neg.emot pre	.331 <sup>1</sup>	.314	.331	20.255	1	41	.000

<sup>1</sup> Predictors: (Constant), Neg. emotion pre

**Hypothesis VI: Levels of depression, anxiety and obsessionality with be higher in the postnatal period.**

To examine any statistical differences between scores at each time point, paired t-tests were performed on the standardised measures pre and postnatally (Table 27). The only significant result was that the women scored higher on the EPDS after giving birth, ( $t = 2.164, df = 42, p < .05$ , two-tailed). No differences were noted on either levels of obsessive behaviour ( $t = 1.656, df = 42, p = .105$ , two tailed), or state anxiety ( $t = 1.172, df = 42, p = .248$ ). The percentage of high scorers ( $> 12$ ) on the EPDS was 4 per cent of the sample prenatally and 9 per cent postnatally. MOCI high scorers ( $>8$ , 1 sd from the mean) rose from 8 to 21 per cent postnatally and those who scored highly on the STAI ( $>38$ , 1 sd from mean) did not change at all between the two time points (17 per cent). The hypothesis was supported.

**Table 27: Paired t-test of pre and postnatal scores on the standardised measures.**

	Mean	S.D.	Std Error Mean	95% Interval difference		t	df	Sig. (2-tailed)
				Low	Upper			
EPDS pre – EPDS post	1.26	3.81	.58	-2.43	-8.47E-02	2.164	42	.036
MOCI pre – MOCI post	.44	1.75	.27	-.98	9.67E-02	1.656	42	.105
STAI pre – STAI post	1.65	9.24	1.41	-4.49	1.19	1.172	42	.248

**Hypothesis VII: The scores on the EPDS, STAI, MOCI and negative emotion will be positively correlated with each other.**

Pearson's  $r$  correlation coefficient was used to analyse the relationship between the total negative emotion scores on the intrusive thoughts interview and the scores on the standardised measures.

#### Prenatal Scores

Table 28 indicates that there was a significant positive correlation between the EPDS and MOCI ( $r = .377$ ,  $n = 48$ ,  $p < .01$ , one-tailed), the EPDS and the STAI ( $r = .596$ ,  $n = 48$ ,  $p < .01$ , one-tailed) and the EPDS and negative emotion ( $r = .354$ ,  $n = 48$ ,  $p < .01$ , one-tailed). The MOCI and the STAI also indicated a positive correlation ( $r = .353$ ,  $n = 48$ ,  $p < .01$ , one-tailed). However there was no significant relationship between negative emotion and the MOCI ( $r = .120$ ,  $n = 48$ ,  $p = .208$ , one-tailed) and

the STAI and negative emotion ( $r = .220$ ,  $n = 48$ ,  $p = .066$ , one-tailed). The alternative hypothesis was partially supported.

**Table 28: Correlations between prenatal negative emotions and results of standardized measures**

		Edinbur PND pre	Maudsley Inventory	State/Tr Anxiet Inventor (State)	Negative emotion (pre)
Edinburgh PND	Pearson	1.00	.37 **	.59 **	.35 **
	Sig. (1-	.	.00	.00	.00
	N	48	48	48	48
Maudsley OC pre	Pearson	.37 **	1.00	.35 **	.12
	Sig. (1-	.00	.	.00	.20
	N	48	48	48	48
State/Trait Inventory (State)	Pearson	.59 **	.35 **	1.00	.22
	Sig. (1-	.00	.00	.	.06
	N	48	48	48	48
Negative emotion (pre)	Pearson	.35 **	.12	.22	1.00
	Sig. (1-	.00	.20	.06	.
	N	48	48	48	48

\*\* . Correlation is significant at the 0.01 level

### Postnatal Scores

The results (Table 29) show that there was a significant positive correlation between the EPDS and negative emotion ( $r = .267$ ,  $n = 43$ ,  $p < .05$ , one-tailed). The EPDS was also significantly correlated with the MOCI ( $r = .361$ ,  $n = 43$ ,  $p < .01$ , one-tailed), and the STAI ( $r = .780$ ,  $n = 43$ ,  $p < .01$ , one-tailed). Negative emotion was also significantly correlated with the STAI ( $r = .437$ ,  $n = 43$ ,  $p < .01$ , one-tailed). At the postnatal stage, negative emotion was not significantly correlated with the MOCI ( $r = .207$ ,  $n = 43$ ,  $p = .091$ , one-tailed). Postnatally, more support for the hypothesis was found than at the prenatal stage. Only the negative emotion and MOCI scores did not support the alternative hypothesis.

**Table 29: Correlations between postnatal negative emotions and results of standardized measures**

		EPDS (post)	MOCI (pos	STAI (post)	Negative emotion (post)
EPDS (post)	Pearson	1.000	.361**	.780**	.267*
	Sig. (1-tailed)	.	.009	.000	.041
	N	43	43	43	43
MOCI (post)	Pearson	.361**	1.000	.317*	.207
	Sig. (1-tailed)	.009	.	.019	.091
	N	43	43	43	43
STAI (post)	Pearson	.780**	.317*	1.000	.437**
	Sig. (1-tailed)	.000	.019	.	.002
	N	43	43	43	43
Negative emotion (post)	Pearson	.267*	.207	.437**	1.000
	Sig. (1-tailed)	.041	.091	.002	.
	N	43	43	43	43

\*\* . Correlation is significant at the 0.01 level (1-tailed).

\* . Correlation is significant at the 0.05 level (1-tailed).

**Hypothesis VIII: There will be a positive correlation between the scores on the EPDS, MOCI and STAI and the frequency, intensity and reduced dismissability of intrusive thoughts.**

The scores on the EPDS, MOCI and STAI were examined in relation to the intrusive thoughts scale characteristics. Pearson's  $r$  correlation coefficient analysed each characteristic of frequency, intensity and dismissability and their relationship to the standardised measures.

#### Prenatal Results

Table 30 illustrates that significant correlations were found at the prenatal assessment between dismissability of the thought and the EPDS ( $r = .364$ ,  $n = 48$ ,  $p < .01$ , one-tailed) and dismissability and the STAI ( $r = .316$ ,  $n = 48$ ,  $p < .05$ , one-tailed). No significant relationship was found between dismissability of the thought and the MOCI ( $r = .140$ ,  $n = 48$ ,  $p = .172$ , one-tailed). Frequency and intensity/discomfort of the thoughts was not significantly related to any of the standardized measures.

#### Postnatal Results

At the postnatal stage (Table 31) Pearson's  $r$  correlation coefficient indicated more significant relationships between the variables than at the prenatal assessment. Thought frequency was significantly correlated with the EPDS ( $r = .31$ ,  $n = 43$ ,  $p < .05$ , one-tailed) and the STAI ( $r = .46$ ,  $n = 43$ ,  $p < .01$ , one-tailed), but not with the MOCI ( $r = -.053$ ,  $n = 43$ ,  $p = .36$ , one-tailed). Intensity was significantly correlated with the depressed mood ( $r = .35$ ,  $n = 43$ ,  $p < .05$ , one-tailed), state anxiety ( $r = .51$ ,  $n = 43$ ,  $p < .01$ , one-tailed) and obsessional behaviour ( $r = .25$ ,  $n = 43$ ,  $p < .05$ , one-tailed). Dismissability also showed a small but significant correlation with the EPDS

( $r = .36$ ,  $n = 43$ ,  $p < .01$ , one-tailed), the MOCI ( $r = .29$ ,  $n = 43$ ,  $p < .05$ , one-tailed) and a larger correlation with the STAI ( $r = .57$ ,  $n = 43$ ,  $p < .01$ , one-tailed). More support was found for the alternative hypothesis at the postnatal stage.



Table 30: Correlations between the prenatal scores of the standardized measures and the scale characteristics of the intrusive Thought

		EPDS (pre)	MOCI (pre)	STAI (pre)	IT frequency (pre)	ITS intensity (pre)	IT dismissability (pre)
EPDS (pre)	Pearson	1.000	.377**	.596**	.205	.227	.364**
	Sig. (1-tailed)		.004	.000	.082	.061	.006
	N	48	48	48	48	48	48
MOCI (pre)	Pearson	.377**	1.000	.353**	-.084	-.101	.140
	Sig. (1-tailed)	.004		.007	.286	.248	.172
	N	48	48	48	48	48	48
STAI (pre)	Pearson	.596**	.353**	1.000	.225	.165	.316*
	Sig. (1-tailed)	.000	.007		.062	.131	.014
	N	48	48	48	48	48	48
IT frequency( pre)	Pearson	.205	-.084	.225	1.000	.620**	.477**
	Sig. (1-tailed)	.082	.286	.062		.000	.000
	N	48	48	48	48	48	48
IT intensity (pre)	Pearson	.227	-.101	.165	.620**	1.000	.664**
	Sig. (1-tailed)	.061	.248	.131	.000		.000
	N	48	48	48	48	48	48
IT dismissability (pre)	Pearson	.364**	.140	.316*	.477**	.664**	1.000
	Sig. (1-tailed)	.006	.172	.014	.000	.000	
	N	48	48	48	48	48	48

\*\* . Correlation is significant at the 0.01 level (1-tailed).

\* . Correlation is significant at the 0.05 level (1-tailed).

Table 31: Correlations between the postnatal scores of the standardized measures and the scale characteristics of the Intrusive Thought

		EPDS (post)	MOCI (post)	STAI (post)	IT frequency (post)	IT intensity (post)	IT dismissability post
EPDS (post)	Pearson	1.000	.361**	.780**	.312*	.352*	.368**
	Sig. (1-tailed)		.009	.000	.021	.010	.008
	N	43	43	43	43	43	43
MOCI (post)	Pearson	.361**	1.000	.317*	-.053	.255*	.293*
	Sig. (1-tailed)	.009		.019	.367	.050	.028
	N	43	43	43	43	43	43
STAI (post)	Pearson	.780**	.317*	1.000	.468**	.514**	.576**
	Sig. (1-tailed)	.000	.019		.001	.000	.000
	N	43	43	43	43	43	43
IT frequency (post)	Pearson	.312*	-.053	.468**	1.000	.807**	.529**
	Sig. (1-tailed)	.021	.367	.001		.000	.000
	N	43	43	43	43	43	43
IT intensity (post)	Pearson	.352*	.255*	.514**	.807**	1.000	.743**
	Sig. (1-tailed)	.010	.050	.000	.000		.000
	N	43	43	43	43	43	43
IT dismissability (post)	Pearson	.368**	.293*	.576**	.529**	.743**	1.000
	Sig. (1-tailed)	.008	.028	.000	.000	.000	
	N	43	43	43	43	43	43

\*\* . Correlation is significant at the 0.01 level (1-tailed).

\* . Correlation is significant at the 0.05 level (1-tailed).

### Bonferroni correction

Table 30 and 31 illustrate the correlations between the standardised measures and the characteristics of the intrusive thoughts interview. Bonferroni corrections should be considered due to the apparent large number of correlations. Usually,  $p < .05$  is the alpha level required for the correction. However, Cohen (1969) discusses the problem of balancing power and  $p$  levels and recognizes that sometimes a level of  $p < 0.1$  is appropriate. To minimize the probability of a Type II error (i.e. to retain high power) a level of  $p < 0.1$  was used. This was particularly relevant for the items on the intrusive interview scale as the nature of their measurement is already susceptible to a Type II error (Rasmussen, 1989). Given that intensity, frequency and dismissability are highly correlated items of the same interview scale; they were treated, in effect, as an independent correlation in applying the Bonferroni correction. Likewise, the highly significant correlations between anxiety and depression indicate that these two measurements could also be treated as highly related and not completely independent variables. In view of all the above, the number of independent correlations is 3, in order to preserve the significance level  $p < 0.1$ , the Bonferroni correction was applied and used  $p < .033$  for the individual correlations.

The only results affected by this correction are the postnatal correlations of the MOCI with ITS intensity ( $r = .225$ ,  $p < .05$ ; Table 31). This correlation is no longer significant at the new level ( $p < .033$ ). It is of note that the prenatal correlation of the MOCI and ITS intensity ( $r = -.101$ ,  $p = .248$ ) was also insignificant suggesting that the correction may have corrected a postnatal Type I error.

**Hypothesis IX: Those participants who experience intrusive thoughts will have higher levels of depression, anxiety and obsessionality than those participants who do not experience intrusive thoughts.**

In this section scores on the standardized measures were compared between those women who did and did not experience intrusive thoughts before and after birth.

#### Prenatal Scores

One-way ANOVA was used to compare the groups on levels of mood. There was no effect of thought experience on any of the levels of mood as measured by the EPDS ( $F(1,46) = 1.645, p = .206$ ), the MOCI ( $F(1,46) = 1.109, p = .298$ ) or the STAI ( $F(1,46) = 1.109, p = .298$ ). The alternative hypothesis was not supported at this stage.

#### Postnatal Scores

One-way ANOVA analyzed the scores of the standardized measures for those women who did and did not experience intrusive thoughts (Table 32). Only the scores of the STAI indicated that there was a small but significant effect (.117) of experiencing the thoughts ( $F(1,41) = 5.410, p < .05$ ). There was no effect of the thoughts on the EPDS ( $F(1,41) = 1.369, p = .249$ ) or the MOCI ( $F(1,41) = .000, p = .986$ ). Only the scores on the STAI supported the alternative hypothesis at the postnatal stage.

**Table 32: Postnatal between subjects ANOVA of effect of thought presence on score on the STAI**

Dependent Variable: State/Trait Anxiety Inventory

Source	Type III of	df	Mean	F	Sig.	Eta
Corrected	444.93 <sup>a</sup>	1	444.93	5.410	.025	.117
Intercep	37430.05	1	37430.05	455.08	.000	.917
ITPOS	444.93	1	444.93	5.410	.025	.117
Error	3372.22	41	82.249			
Total	44769.00	43				
Corrected	3817.16	42				

a. R Squared = .117 (Adjusted R Squared = .095)

## SUMMARY OF RESULTS

As this chapter contained the results of many different variables and their relationship to different aspects of the intrusive thoughts, this short summary intends to clarify the main findings.

### Prenatal summary

Seventy-one percent of women experienced intrusive thoughts at the prenatal assessment stage. The content of the thoughts prenatally concerned themes of harm occurring to a mixture of the participants, their spouses and the unborn baby. The concordance of pre and postnatal thoughts was relatively high. At each time point the characteristics of frequency, intensity and dismissability were correlated. The levels of negative emotion experienced prenatally were associated with the frequency, intensity and dismissability of the thoughts. Seventy-nine percent of women responded to their thoughts at this stage and those who responded experienced more intensity/discomfort and found it more difficult to dismiss the thoughts. No effect of response on any of the measures of negative emotion was found. Prenatal levels of depression and young maternal age predicted postnatal levels of depression and anxiety and prenatal score on the MOCI and negative emotion predicted the respective postnatal scores of these measures. Generally at this stage of assessment, levels of depression, anxiety and obsessionality were very low, although the higher the EPDS score the higher the level of negative emotion. The percentage of those scoring high on the EPDS was 4 per cent, on the MOCI 8 percent and on the STAI, 17 per cent. Prenatally, the scores on the EPDS and the STAI were both associated with more difficulty in dismissing the thoughts.

### Postnatal Summary

The incidence of the thoughts was lower postnatally at 65 per cent and the content of the thoughts changed to almost exclusive focus on harm coming to the baby, either accidentally by the mother or other and occasionally deliberate harm by the mother. Negative emotion was associated with the frequency, intensity/discomfort and the dismissability of the thoughts. Those who experienced the thought more frequently had more difficulty in dismissing it. There were fewer responders at the postnatal stage (65 per cent) and no effect of response on any of the measures of negative emotion was found at postnatal assessment. The participants who responded did not experience the thoughts more frequently, however, responders did experience the thoughts more intensely and had more difficulty in dismissing them. There were significantly higher levels of depressive symptoms postnatally and more high scorers on the EPDS and the MOCI, although not on the STAI. In addition scores on the EPDS were associated with higher negative emotion and scores on the STAI. The effect of levels of mood disturbance as measured by the standardized questionnaires also meant that the thoughts were more frequent, intense and difficult to dismiss.

### Summary of longitudinal results

In general, the prenatal scores on the standardised measures predicted the postnatal scores. This was true for all measures apart from the STAI. Prenatal young maternal age and the EPDS predicted postnatal STAI better than the prenatal STAI score. Young maternal age was also a predictor of postnatal EPDS along with prenatal EPDS. Postnatal negative emotion was predicted by prenatal negative emotion.

The aim of this study was to explore the phenomena of intrusive thoughts in a non-clinical sample of mothers before and after they give birth. Part of this exploration also included examining the relationship between characteristics of these thoughts such as frequency, intensity and dismissability and variables such as depression, anxiety and obsessionality. Although the sample was non-psychiatric, research has portrayed this period in a woman's life as one of potentially high anxiety pre and post birth and with the possible onset of low levels of depression (baby blues) in the weeks immediately following delivery. Literature on OCD (Abramowitz *et al.*, 2003a; Buttolph & Holland, 1990; Neziroglu *et al.*, 1992; Williams & Koran, 1997) suggests that this time is a particularly vulnerable period for the onset of obsessional difficulties, especially in those already susceptible, which may in turn affect the experience of the intrusive thoughts. The longitudinal design of this study has enabled the author to assess these variables both pre and post birth with a view to making comment on the above.

## **INTRUSIVE THOUGHTS**

### **Incidence and Content**

The intrusive thoughts in the current study of non-clinical mothers bore much resemblance to previous literature on these types of upsetting cognitions in other non-clinical populations. The incidence of prenatal thoughts in this sample was 71 per cent, roughly comparable to the incidence of 79 per cent reported by Rachman and De Silva (1978) in a student population, although somewhat less than the incidence of 88 per cent reported by Salkovskis and Harrison (1984) in a their



student sample. Both these studies assessed a range of thoughts and impulses, whereas the current study focussed on the characteristics of the most common intrusive thought. It is possible that impulses in particular, of which only 2 women admitted to experiencing, were less likely to be reported in this female sample, due to their perceived unacceptability especially in their pregnant condition. In Rachman and De Silva's (1978) sample, impulses alone and impulses and thoughts together accounted for 74 per cent of the total amount of intrusions experienced in the sample. Impulses were reported for only 4 per cent of these participants. At postnatal assessment the incidence of intrusive thoughts reduced further to 60 per cent, although correlations between those women who experienced intrusive thoughts prior to birth and those who experienced them postnatally were quite high. The percentage in the current study was higher than the percentage quoted by Leckman *et al.* (1999); only 34 per cent of their mothers reported such intrusions. This may be explained by the different focus of their study, which examined specific maternal preoccupations surrounding the imminent birth and issues around caring for the child. The percentage of thoughts reported in a study by Abramowitz *et al.* (2003b), however, supports the rate of reporting of such thoughts in the current study. They surveyed both mothers and fathers of children under the age of 2 years and the incidence of the thoughts in their sample of mothers was 69 per cent.

The content of the intrusions in the current study bore the same unpleasant/tragic themes such as harm occurring to someone, the death of loved ones and sometimes unpleasant sexual themes that were prevalent in the studies by Rachman and De Silva (1978) and Salkovskis and Harrison (1984). Again, the very nature of these

intrusive thoughts could partly explain the lower rate of positive identification of them in the current sample. While it is difficult enough to verbalise the unpleasant nature of these thoughts with regard to adults, the women in the current study were expressing disturbing thoughts of harm occurring to their unborn/newborn child, whose very protection depended upon them. Twenty-one of the 34 mothers who identified these intrusions reported thoughts either verbally or in picture form that involved direct harm or disfigurement to their unborn child or indirect harm as a result of harm happening to themselves, which was often focussed in their abdominal area. The reduced reporting at the postnatal stage could possibly be explained by a reluctance to report such disturbing cognitive phenomena now that the infant was actually present and the sole responsibility of the parents, if not the mother. Rachman (1993) notes that it is precisely because the “victims” who feature in intrusive thoughts are so helpless, that the thoughts are “utterly immoral”. Jennings *et al.* (1999) concurred that the brevity of the interview given and the reluctance of the mother to admit such thoughts could possibly explain the low reporting of intrusive thoughts of infant harm in their sample of 46 mothers with children under the age of 3 years. Seven per cent of that sample admitted thoughts of deliberate harm towards their children. The incidence of thoughts of deliberate harm in the current sample was slightly higher. Four out of 34 mothers (12 per cent) postnatally reported thoughts involving some deliberate intent on their part. The information given during the intrusive thoughts interview was provided within a framework of normalisation of this experience and the interviewer was more familiar with the women having met them prior to their babies being born. These two factors should have helped put the participants at ease and according to Jennings *et al.* (1999) increased the reporting of

these thoughts of deliberate infant harm. It is interesting that Abramowitz *et al.* (2003b) used an anonymous survey, which provided some normalising information regarding the occurrence of intrusive thoughts. This is possibly the optimal method of collecting this type of sensitive data, as their incidence of mothers reporting intrusions of deliberate infant harm rose to 21 per cent of the total intrusive thoughts reported. The current study found that it was more common in the postnatal period to report thoughts of others harming the baby, harm occurring with no agent involved, or an accident occurring. Twenty-one women (34 per cent) reported such thoughts. Jennings *et al.* (1999) speculate in their discussion that

“passive thoughts of harm (e.g., the infant falling out of the window without the mother or anyone else seen as agent)”

might be more common in non-depressed mothers than thoughts of the mothers themselves harming the infant. Certainly in the current study, passive thoughts of harm (no agent involved) were experienced by 15 per cent of those who had the thoughts. However, Jennings *et al.* (1999) did not assess for the mother’s intent (accidental versus deliberate) with regards to thoughts of her harming her infant, or harm being caused by any other person. When these two features are included, thoughts of accidental harm and others harming the baby increased the non-deliberate (passive) thoughts of harm to 21 (34 per cent) women. Thoughts of accidents in the study by Abramowitz *et al.* (2003b) accounted for 24 out of the total of 90 (21 per cent) thoughts experienced by their sample of mothers. That was a somewhat lower rate than was evident in the sample in the current study and could possibly be explained by underreporting of intentional themes of intrusive thoughts in this sample, in favour of reporting accidental content in the intrusive thoughts. It is of note that thoughts of accidental or deliberate harm to the infant by the mother, or

anyone else, often involved harm occurring around the head and neck part of the infant's body. Realistically, these areas are the most susceptible and need support both due to the baby's lack of muscle development to sustain it's own head control and also the wide fontanelle on the skull that remains open and therefore an area of vulnerability for a year and more.

No women reported intrusions that appeared to be related to a traumatic birth experience. Although formal assessment of birth procedures was never part of the remit of the current study, it is possible that in the context of the researcher participant relationship, details of any trauma experienced would have emerged if experienced. No women were excluded from the study due to trauma in childbirth, however one participant was excluded due to her infant's serious medical condition. Generally, the intrusions reported by the participants in the current study, were similar to the senseless, inappropriate and egodystonic types of thoughts (De Silva & Rachman, 1992; Rachman & Hodgson, 1980) found in obsessional conditions and the general population (Rachman & De Silva, 1978). The case studies by Ballard *et al.* (1995) illustrate very well the type of thoughts that women with childbirth onset PTSD tend to experience. Either the thoughts are trauma related "intrusive thoughts and images of the delivery while awake" or quite extreme images of perhaps a dead baby "white-faced, wax-like, wrapped in a shroud". The follow-up in the current study of 4-6 weeks would be within the time frame that other studies have found that PTSD symptoms have developed (Ayers & Pickering, 2001; Creedy *et al.*, 2000). Ayers and Pickering (2001) suggest that rates of PTSD are higher at 4-6 weeks postpartum than at 6 months. At 6 months the rate of PTSD dropped from 2.8 per

cent to 1.5 per cent, in their sample of 289 women. The sample size in the current study of 43 participants makes it less likely that any cases of PTSD would be present.

### **Frequency, Intensity and Dismissability**

Although the scale used to assess these characteristics of the intrusive thoughts was by no means standardised, it did demonstrate a relationship between these three variables. In the current study, the more frequent the thoughts, the more intensely/uncomfortably they were experienced and the more difficult they were to dismiss. Ease of dismissability was originally assessed by Rachman and De Silva (1978), but not in relation to the other two variables assessed in this the current study. Rachman and De Silva (1978) investigated dismissability in relation to type of thought experienced (e.g., thought versus impulse) and came to no conclusions due to a small sample size, although they noticed that the general tendency was for impulses to be more easily dismissed than thoughts. This particular relationship was not assessed in the current study as only two women experienced prenatal impulses and only one woman reported an impulse at the postnatal stage. Results reported by Salkovskis and Harrison (1984) were replicated to an extent by the current study. Salkovskis and Harrison (1984) found that those participants who found their intrusive thoughts hard to dismiss rated their discomfort as greater. Discomfort was conceptualised as intensity for the purposes of this study and despite potential theoretical difficulties of twinning these two constructs; intensity and dismissability produced much the same relationship in this study as discomfort and dismissability did in the research by Salkovskis and Harrison (1984). Parkinson and Rachman (1981) measured both discomfort and intensity in their study and found the two concepts to be related.

The association between frequency and dismissability was also found to be significant in the current study, but not in the study by Salkovskis and Harrison (1984). This lack of association surprised these authors, however they did not proceed to explain why the relationship was not found. Differences in the way dismissability was rated between the current study and theirs are apparent. Although frequency was measured in a similar manner in both studies, dismissability in their study was rated dichotomously as either “easy” or “not easy.” The current study used a more continuous scale, perhaps allowing for more discrimination in the rating of dismissability, which produced a different result. Parkinson and Rachman (1981) and Clark and Nikki (1989) all found a relationship between frequency of negative intrusions and difficulty in dismissing them.

## **Response to thought**

### Incidence of responding

Twenty-seven out of the 34 (79 per cent) women who experienced the thoughts prenatally made some effortful response to the thought in an attempt to dismiss it. These responses included, reassuring themselves that the thought was ridiculous, rationalising the unlikeness of it occurring or trying to think of something else (thinking attentively). Distraction responses were mainly behavioural responses that included leaving the room, holding the baby tighter or switching on the TV. In addition, the women described other responses such as talking over the thoughts with their partners, if they were present at the time the thought occurred. This replicates the results from Freeston *et al.* (1991), although far more of their sample (92 per

cent) made effortful and multiple responses to the thoughts. Only 8 per cent of Freeston *et al.*'s (1991) sample reported doing nothing when the thoughts occurred, in comparison to 19 per cent of this current sample. Their result could be explained by the fact that they assessed a number of different types of intrusive thought and the responses that were made to them. If just one thought is assessed, as was the case with the current study, it is perhaps less likely that the participant will be aware of any response that is made to that thought. Perhaps the more thoughts that are assessed, the greater likelihood that a response will be made, simply because of the respondent's awareness of the cognitive exercises that are occurring. In addition, the distribution of the questionnaires was anonymous in the study by Freeston *et al.* (1991) and as mentioned previously this could have an impact on the participant's likelihood to respond honestly to the sensitive nature of the information being collected.

#### Response and the association between frequency, intensity and dismissability

Unsurprisingly, both pre and postnatally, those who found the thoughts more difficult to dismiss, made an effortful response to them. Although the amount of effort actually involved was not assessed. The results of the current study also indicate that the higher the intensity/discomfort felt when the thoughts occurred, the more likely that a response would be made to the thought. This relationship was not present for the frequency of the intrusive thoughts. There was no significant difference in frequency between those who did and did not respond. Response, according to Salkovskis (1989), is dependant on the salience of the intrusions experienced and the exaggerated sense of responsibility for the thoughts occurrence or contents.



Salkovskis (1989) labels this response as neutralisation and according to Freeston *et al.* (1991) neutralising is widespread in their sample and therefore “the norm.” They comment that this discovery in their non-clinical population was surprising, presumably because this effortful neutralisation is prevalent in OCD rather than non-clinical populations. Certainly in the studies of Jennings *et al.* (1999) and Abramowitz *et al.* (2003a), response and its association with dismissability, intensity and frequency of the thoughts was not measured, so the results from the current study cannot be examined with reference to these previous ones. Future studies may wish to examine the effect of preventing a response to the intrusive thoughts in non-clinical populations, which may establish a difference in levels of discomfort/anxiety between OCD and normal samples. Perhaps it is only at this level of processing that real differences can be found.

#### Response as a factor in levels of negative emotion

In the current study, levels of emotional intensity as measured by the total negative emotions score and depression, anxiety and obsessionality were examined in those groups who did and did not respond to their thoughts. No effect of response group was found for any of the negative emotions either pre or postnatally. This result differs to the result in the study by Freeston *et al.* (1991), where response group effects for anxiety were found, as measured by the Beck Anxiety Inventory (Beck, 1993), and also group effects for sadness and worry, as measured by the scale on the Cognitive Intrusions Questionnaire. The lack of scale development for the intrusive thoughts interview as a whole will have contributed to the lack of result in the current study. Freeston *et al.* (1991) measured sadness and worry along a Likert type scale



whereas sadness and worry in the current study were only marked by their absence or presence. Freeston *et al.* (1991) were also much more discriminating in their categorisation of the responses that their participants made. Essentially the current study only discriminated between response and no response in a sample that was also a lot smaller than the sample in the study by Freeston *et al.* (1991).

In a very well controlled study Ladouceur, Freeston *et al.* (2000) compared the responses to intrusive thoughts in a community, an OCD and an anxiety sample. In their study, intense and repeated structured interviews were used to establish thought response strategies, efficiency and perseveration of the strategies, the functional linkage between the intrusive thought and the response and the emotional intensity of the thoughts for all three groups. The methodology used, produced results, which indicated that the strategies used by their non-clinical group were also represented in the women's experience in the current study. Out of the 1,064 strategies elicited in the entire sample, the four most popular strategies for Ladouceur *et al.*'s (2000) non-clinical sample were, convincing oneself that thoughts were ridiculous (95 per cent), distracting activity (84 per cent), reassurance seeking (68 per cent) and doing nothing (68 per cent). The result in the study by Ladouceur *et al.* (2000) could not be replicated to the same extent in the current study partly due to the intensive methodology used by Ladouceur *et al.* (2000). The combination of the nature of the questions being asked and the perceived vulnerability of pregnant women meant that repeated interviews focussed on fairly intense cognitive questioning would have raised problematic ethical questions for the current study. The emotional intensity of the thoughts in the study by Ladouceur *et al.* (2000) unsurprisingly was found to be

higher in the clinical groups. Intensity of mood was measured on a 5-point Likert scale not unlike the one in this study. However, their results do not expand on this. There is no information regarding the specificity of the mood states or whether different response styles have a differential effect on mood.

## **Emotional Content**

### Frequency, Intensity and Dismissability

The emotional experience of the thoughts was measured by allowing the women to choose as many negative emotions as they wished from a pre-prepared list. Total negative emotions scores were obtained simply by adding the total number of emotions chosen. This provided an estimation of the level of negative emotion experienced by the women who reported the intrusive thoughts. At both the pre and postnatal stages, total negative emotion (emotional intensity) was found to be related to frequency, intensity/discomfort and dismissability of the intrusions. Clark and De Silva (1985) also assessed emotional content of intrusive thoughts in their non-clinical sample specifically focussing on sadness and worry and the levels of each of these emotions when anxious and depressive cognitions were experienced. Their anxious cognitions (intrusive thoughts) in particular, elicited more sadness and worry than the depressive statements and the combination of sadness and worry, which they conceptualised as emotional intensity, was closely related to the dismissability of the thoughts.

## **Intrusive thoughts and their association with the EPDS, MOCI and STAI**

Intrusive thoughts have been variously associated with different mood states and levels of pathology in past literature. More often than not these levels of pathology have been high as the samples used were psychiatric. In this section of the discussion, lower levels of these states will be examined in relation to intrusions in the sample, which although non-clinical, often presents, according to the literature, with higher than usual levels of depression, anxiety and obsessionality.

### Intrusive thoughts and depressive symptoms

In the current study, there were no differences either pre or postnatally in depression scores between those women who did and did not experience intrusive thoughts. However, at the prenatal stage, EPDS scores were positively related to difficulty in dismissing the intrusions and the emotional intensity of the thought as measured by the total negative emotion score. Rachman and Hodgson (1980) have reviewed many studies that had noted a positive relationship between depression and intrusive thoughts (obsessions) in OCD populations. Research also exists to suggest that intrusive thoughts are a disturbing feature of women who are postnatally depressed (Fernandez, 1992; Jennings *et al.*, 1999). Previous research has also examined the role of dysphoria and various characteristics of intrusive thoughts in non-clinical populations (Clark & Hemsley, 1985; Niler & Beck, 1989; Reynolds & Salkovskis, 1991; Sutherland *et al.*, 1982). The results have been mixed. Reynolds and Salkovskis (1991) examined depression in relation to presence and frequency of intrusive thoughts in their non-clinical sample and found a positive relationship between depression and presence, and depression and frequency of the thoughts.

However, Clark and Hemsley (1985), Edwards and Dickerson (1987) and Niler and Beck (1989), did not. Sutherland *et al.* (1982) did discover that a dysphoric mood state made it more difficult for their non-clinical participants to remove an intrusive thought by replacing it with a neutral thought. They explain this result in terms of the participant having difficulty substituting a more acceptable thought to replace the intrusive one while in a dysphoric state. The studies by Edwards and Dickerson (1987) and Sutherland *et al.* (1982) were too artificial to be compared with the current study, even though the Sutherland *et al.* (1982) study appears to show similar results. Both the thoughts and the emotion were laboratory induced. Also, the study by Sutherland *et al.* (1982) presupposes that there is only one preferred strategy for thought removal, which would involve replacing it with a neutral/pleasant thought. As the current and other studies (Ladouceur *et al.*, 2000) have suggested, people naturally use many strategies for removing unwanted intrusions.

Those studies that indicated no relationship between depression and intrusive thoughts (Clark & Hemsley, 1985; Niler & Beck, 1989) used study designs similar to the current study, in that both measured naturally occurring intrusive thoughts and used standardised depression measures (BDI-II; Beck *et al.*, 1994) to assess for low mood. However there were still too many differences in the studies to provide an explanation for the inconsistent results. A study that closely mirrors the features of the current study is that of Abramowitz *et al.* (2003b). They indicate an association between depression and severity of intrusive thoughts in their sample of community postpartum women. Severity was measured by interference of the thoughts in daily life, distress experienced, the ability to control them, and the amount of discomfort

felt on disclosure. In the study by Abramowitz *et al.* (2003b), all severity items showed a positive relationship with depression as measured by the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The study by Abramowitz *et al.* (2003b) had a sample size of 300 mothers, compared to the current study of only 43 mothers and 18 per cent of their sample had a past history of either depression or OCD. These facts could go some way to explaining the differences between the current study and that of Abramowitz *et al.* (2003b). Another reason for a significant and possibly more accurate result in the Abramowitz *et al.* (2003b) study is that they used superior scales, derived from a standardised tool (YBOC-S; Goodman *et al.*, 1989a, 1989b).

The levels of low mood in this sample were not at a clinical threshold. However for many of the women, the scores on the Edinburgh Postnatal Depression Scale reached or exceeded the cut-off of 9 points suggested by Cox *et al.* (1987) as indicative of the presence of postnatal depression. However, it might be that even though the EPDS score was fairly high, the actual levels of depression were mild and improving over the weeks as Cox *et al.* (1987) suggest. During the semi-structured interview, if a score of 9 or over was reached, the women were assessed further for symptoms of depression. Anecdotally, all but one woman, when asked reported that their mood had improved over the weeks as life began to be a little more settled. Although not formally assessed, retrospectively it appears doubtful that the experience of the intrusions interfered in daily life for many, if any of the participants in this sample. It is possible that the type of low mood experienced by these mothers was more akin to the “baby blues” and not the type of affective disturbance which arises from the

negative evaluation of the thoughts presence, which may prime concepts of self blame and which in turn can lower mood (Salkovskis, 1985).

### Intrusive thoughts and anxiety

Only at the postnatal stage was there an effect of state anxiety. Those women who felt more anxious were more likely to experience the thoughts more frequently, more intensely and have more difficulty dismissing them. Anxiety also showed a positive relationship to total negative emotion scores experienced in conjunction with the thoughts. No effect of anxiety was seen however between those who did and did not respond to the thoughts. Anxiety has been assumed to have a role in the experience of intrusive thoughts due to the extensive research on OCD as an anxiety disorder. However of the non-clinical population, again the results are mixed. Freeston *et al.* (1991) did find that non-clinical participants, who responded to intrusive thoughts had higher BAI scores than those who made no response. Factors that made it difficult to compare the two were that Freeston *et al.*'s (1991) research used the BAI to assess anxiety and a standardised measure for assessing intrusions. The current study measured anxiety using the State form of the STAI and intrusions were assessed by interview questions, that although did show some internal consistency, were by no means as reliable as a fully standardised measure.

Both Niler and Beck (1989) and Clark and Hemsley (1985) assessed anxiety using the Trait form of the STAI in their articles. Niler and Beck (1989) also revealed that anxiety was significantly related to difficulty dismissing the intrusive impulse and the distress elicited by this impulse. Extrapolation to the current study was difficult

as Niler and Beck (1989) distinguished between thoughts and impulses and did not get the same result for intrusive thoughts. The participants in the current study did not experience enough impulses for any distinction to be made. Clark and Hemsley (1985), who also used the STAI, did not really analyse anxiety in particular relation to intrusive thoughts. They also examined trait anxiety, but in a framework of individual differences in relation to the experience of intrusive thoughts. Trait anxiety, they suggest, is strongly associated with depressive negative intrusions rather than the anxious intrusive thoughts similar to the ones assessed in this study.

The positive correlation between STAI anxiety and the total emotions score could either be an artefact of the study design, or a reflection of the summation of three different types of anxiety. As previously mentioned the list of emotions was constructed partly as a result of the pilot study and the cognitive interviewing of the eight women who participated. As a result of their answers, anxiety based emotions were probably over represented in the list. Fear, Anxiety and Worry were all available as choices and many study participants chose more than one. The reason for the inclusion of all the anxiety based emotions and not just one representation, was that the pilot study women were rightfully adamant that the feelings of anxiety, worry and fear were different. One woman described that while anxiety and worry may have a cognitive component, fear was experienced more physically. Another remarked that when she worried, more often than not, she knew what she was worrying about. Pilot study participants remarked that general anxiety had more of an unknown quality about it. Therefore, it stands to reason that an anxiety measure of



how you are feeling *right now* might serve as a summary of all three anxiety based emotion.

Worry about intrusive thoughts was a popular choice for the participants both at the prenatal and postnatal stages of assessment. Thirty-eight per cent of women experienced worry when they had an intrusive thought before they gave birth and 21 per cent, after the baby was born. Prior to the assessment of the thought, the women were given some information about intrusive thoughts to assist them in their decision as to whether they had experienced any. This information was based around research that has concluded that worries and intrusions have fundamental differences (Langlois *et al.*, 2000). Occasionally, deciding whether a thought was a real life worry or an intrusion required some investigating. For example, a participant who experienced the thought “what if my baby is stillborn” described that as a real worry. However when the thought was investigated more thoroughly, it was clear that it was more of an intrusion as it could not be problem solved, had no basis in real life (there was no medical reason to believe this) and it did not lead to other types of worrying (Langlois *et al.*, 2000a). It was also egodystonic, completely alien to the woman’s values, belief system and sense of self (Langlois *et al.*, 2000b). The distinction between intrusions and worries, however, is not always that clear. Langlois *et al.* (2000b) discovered there might in fact exist common processes that are shared over much of a continuum. They argue that the emotional experience of either the intrusive thought or the worry, is located differentially. For the intrusive thought, the emotion depends on the egodystonic nature of the thought. For example, the more alien the thought to the person’s beliefs, the more emotionally charged the thought



would be. Worries that are perceived to have a basis in reality will be more emotionally charged than worries that don't really exist. By using this guide, identification of thoughts as intrusions rather than worries, became clearer for the participants. The continual rather than categorical nature of these cognitive processes as described by Langlois *et al.* (2000a, 2000b) may also be relevant when the content of the thoughts are examined. If the feeling of worry exists along a continuum, presumably an intrusive thought can turn into a real life worry. Anecdotally, one participant described this very process after her baby was born. While out at the cinema, she had the thought "what if we were blown up". This led her to worry about who would look after her baby, which in turn led to her and her husband writing a will and making plans for guardianship of the child should anything happen to both of them. What started out as perhaps an intrusive thought (no basis in reality, can't be problem solved, egodystonic) became a real concern that although still had no current basis in reality, could be dealt with in a manner that left the woman feeling that something had been done and this alleviated her worry.

#### Intrusive thoughts and obsessional symptoms

Intrusive thoughts have always been linked with obsessional problems, especially OCD (Rachman, 1980). However in this study, there appeared to be no relationship between the presence of the thought and scores on the MOCI. Only at the postnatal stage was a link found between the MOCI and dismissability of the thought. This lack of response may have something to do with the very low mean score of the group. This was even lower than the scores of the undergraduates that Stoylen, Larsen and Kvale (2000) cited in their study that compared the MOCI scores of

obsessional patients and students. Two previous studies (Clark & Hemsley, 1985; Reynolds & Salkovskis, 1991) failed to find an association between MOCI score and any characteristics of intrusive thoughts. At least one of these studies (Reynolds & Salkovskis, 1991) used a non-clinical sample whose mean score was higher than the score of the group in the current study.

Jennings *et al.* (1999) proposed that obsessional tendencies might be a predictor of intrusive thoughts of infant harm in this particular group. This hypothesis was based on their finding of increased rates of obsessional symptoms among women with postnatal depression who in turn experienced intrusive thoughts of infant harm. As these thoughts were also present in 7 per cent of non-depressed mothers, Jennings *et al.* (1999) suggested that obsessionality rather than depression might predict these intrusions. This hypothesis was not supported in the current study.

## **LONGITUDINAL RESULTS**

The prospective design of this study enables comment to be made on pre and postnatal levels of depression, anxiety and obsessional symptoms in this sample. The analysis of all the standardised measures indicated no differences in levels of anxiety or obsessionality before or after giving birth. Prenatal symptoms of depression and a younger maternal age predicted postnatal symptoms of depression and postnatal levels of state anxiety. Prenatal obsessional behaviour predicted postnatal obsessional behaviour and prenatal negative emotion predicted postnatal levels of negative emotion. Levels of depressive symptoms, were statistically significantly

higher at the postnatal stage, however only one of these women reached a level of depression that could be described as clinical.

## **Depression**

### Predictors of depressive symptoms

The current study found that although prenatal EPDS, STAI, younger maternal age and negative emotion were correlated with postnatal scores on the EPDS, only prenatal depressive symptoms and maternal age predicted postnatal scores on the EPDS. These prenatal depression results replicate findings in earlier studies (Brugha *et al.*, 1998; Gotlib *et al.*, 1991; Righetti-Veltema *et al.*, 1998) despite a considerably smaller sample than used in the studies above ( $n = 507$ , Brugha *et al.*, 1998;  $n = 780$ , Gotlib *et al.*, 1991;  $n = 570$ , Righetti-Veltema *et al.*, 1998). Statistically the current study was underpowered for the type of analysis required to produce robust results for predictors of levels of depression (Brace, Kemp & Snelgar, 2003). The study by Gotlib *et al.* (1991) used the BDI to measure depressive symptoms in their sample. The current study used the EPDS, which was specifically designed to help reduce the confounding effect that the state of being pregnant or having a new baby may have on the results of the BDI. This confounding effect has been shown to be evident on items such as lack of sleep and energy (Harris *et al.*, 1989).

Contrary to the results in the current study, Gotlib *et al.* (1991) found maternal age not to be a significant predictor of levels of depressive symptoms in their sample of 780 women. Gotlib *et al.* (1991) provide no mean age or age range for their sample, so no interpretation of this result can be made. Other studies over the years have also

failed to find an association between PND and maternal age (Carothers & Murray, 1990; O'Neill, Murphy & Greene, 1990; Wickberg & Hwang, 1997; Windridge & Berryman, 1999). Those studies that do initially find an association between these two variables, ascertain that when other variables such as socio-economic status (Spencer, 2001) and age of first baby (Astbury, Brown, Lumley & Small, 1994) are taken into account the association between younger maternal age and PND disappears. Not enough data relating to other socio-economic factors was assessed in the current study to control for these potential confounding variables, which may account for the association of young maternal age and levels of depressive symptomatology.

#### Rates of depression

The authors of the EPDS (Cox *et al.*, 1987) investigated the onset, duration and prevalence of depression in a matched sample of postnatal women and women who had not had children in the past 12 months. At 6 months the prevalence between the 2 groups was almost identical. However, within 5 weeks of childbirth a threefold higher rate of depression onset was observed in the childbirth group (Cox, Murray & Chapman, 1993). This replicates an earlier study by O'Hara, Zekoski, Philips & Wright (1990), which used the same prospective time period that the current study utilised. Postnatal assessment of depressive symptoms in the current study was between 4-7 weeks postnatally; well within the window of increased vulnerability suggested by Cox *et al.* (1993), however the scores did not increase. Cox *et al.* (1987) suggested that any woman scoring 12 or higher on the EPDS should be screened further as this score suggests the presence, although not the severity of

postnatal depression. The number of women scoring 12 or above prenatally rose from only 4 per cent to 9 per cent at the postnatal stage. This is at the lower end of the rates (8 –27 per cent) quoted by Matthey, Barnett, Howie & Kavanagh (2000). Interestingly, while administering the questionnaire in the current study, a number of women made it clear that had the EPDS been administered a couple of weeks prior to assessment their score would have been higher.

The study by O'Hara *et al.* (1990) was a well-controlled prospective study using a matched sample. The EPDS was not used, but many other measures were. The self-report measures included the BDI (Beck *et al.*, 1961), the SCL-90-R (Derogatis, 1983), The Social Adjustment Scale-self Report (SAS-SR; Weissman & Bothwell, 1976) and a visual analogue scale of five positive and eight negative mood states. In addition to all these self-report scales, two interviews were carried out at each time point. They also used interrater reliability for diagnosis of major and minor depression, obtaining high correlations. To summarise O'Hara *et al.*'s (1990) findings, although a higher percentage of childbearing women than non-childbearing women experienced depression, the difference was not significant. Mild dysphoria (the blues) at the assessment after delivery (3 weeks) was more common in the childbearing women and anecdotally it appears that the results from the current study may have replicated this had assessment taken place earlier. The slightly higher percentage of those scoring 12 or over postnatally may represent the remaining few women still experiencing the "baby blues".

The prevalence rates for major depression were in the range of the 1-month prevalence rates for women of a similar age in epidemiological area studies (Regier, Boyd, Burke, Rae, Myers, Kramer, Robins, George, Karno & Locke, 1988). So although the current study had no similar comparison group to that of O'Hara *et al.* (1990), their result of no major increase in clinical depression in a non-clinical sample of child bearing women was comparable to the result in the current study.

## **Anxiety**

### Predictors of postnatal anxiety

In the current study, postnatal anxiety levels measured by the STAI were predicted by prenatal EPDS score and a young maternal age. When analysed in a stepwise regression alongside these 2 variables, the prenatal STAI score was not a significant predictor. However when analysed under an enter method of regression analysis, prenatal STAI accounted for a small amount of the variance of postnatal STAI scores. The postnatal STAI was however, significantly correlated with the prenatal STAI, EPDS, MOCI, younger maternal age and negative emotion score. The lack of significance for the prenatal STAI scores as a prediction criterion could be explained by the state rather than trait nature of the scores. Also the relationship between anxiety and depression has a long history in the general population (Chavira, Stein, Bailey & Stein, 2004; Lenze, 2003; Maier & Falkai, 1999; Rodney, Prior, Cooper, Theodoros, Browning, Steinberg, & Evans, 1997).

In contrast to the considerable amount of interest in PND, postnatal anxiety has been relatively neglected as a subject for research. Stuart, Couser, Schilder, O'Hara &

Gorman (1998) examined the relationship between state and trait forms of the STAI and EPDS in a prospective study of a community sample of 107 women. They found that the state form of the STAI and the EPDS were significantly correlated, showing comparable results to the current study. Stuart *et al.* (1998) performed no regression analyses so the relative weight of prediction for each variable was not measured. It may be that the results in this relatively small sample ( $n = 107$ , Stuart *et al.*, 1998), compared with other research in the area ( $n = 507$ , Brugha *et al.*, 1998;  $n = 780$ , Gotlib *et al.*, 1991;  $n = 570$ , Righetti-Veltema *et al.*, 1998), has affected the reliability of the results in a similar fashion to the results in the current study. Stuart *et al.* (1998) speculate that the EPDS may be a better screening instrument for the prediction of postnatal anxiety than anxiety measures.

Heron, O'Connor, Evans, Golding & Glover (2003) examined the prediction of anxiety and depression from 32 weeks gestation to 8 months postpartum in a very large sample ( $n = 8,323$ ) of community women. Prenatal anxiety was predictive of postnatal anxiety at 8 weeks and 8 months. They measured anxiety using anxiety items from the Crown-Crisp Experiential Index (CCIE; Crisp, Jones & Slater, 1978). This index correlates well with the STAI (Heron *et al.*, 2003), however use of this measure does not provide any information on the relative strength of state versus trait anxiety in the prediction of postnatal anxiety. One of the strengths of the study by Heron *et al.* (2003) is the very large sample used, the results of which are used to highlight the importance of investigating postnatal anxiety as well as PND.

### Rate of anxiety

State anxiety as measured by the STAI did not increase between the pre and postnatal period. As with the EPDS, the mean scores for this sample on the STAI were lower (mean = 29.3) than that of other non-clinical populations (Spielberger *et al.*, 1983) at both the pre and postnatal stages of assessment. This is at odds with other research (Altshuler *et al.*, 1998; Pitt, 1985; Shear & Oommen-Mammen, 1995; Stuart *et al.*, 1998). Stuart *et al.* (1998) used the STAI to assess anxiety rates at 14 weeks and 30 weeks postpartum and found that 8.7 per cent of their community sample had scores on the STAI which indicated a diagnosis of anxiety. It is of note, that for these women, the state anxiety increased rather than decreased over the assessment period, though this was not statistically significant. Perhaps this trend may have occurred in the current sample had the follow-up been longer than 4-7 weeks. Differences in diagnosing anxiety also exist between this study and the one by Stuart *et al.* (1998). In conjunction with STAI, they also used the BAI and diagnosed anxiety by using a score of  $> 10$  on this measure to assist in diagnosis. Stuart *et al.* (1998) report that the correlations between these scales were good, however a STAI score of 31 at 30 weeks does not appear to be high enough to warrant a diagnosis of anxiety. In spite of the low mean score of the current sample, they can be split into high and low anxiety groups.

A study by Brouwers *et al.* (2001) on effects of maternal anxiety on infant outcomes described how 35 per cent of their community sample had a score higher than 37 on the STAI (1 SD above the mean). Using Brouwers *et al.*'s (2001) criteria, 19 per cent of this sample could be described as having high anxiety prenatally and this



percentage was exactly the same (19 per cent) for the postnatal period. Brouwers *et al.*'s (2001) research, unlike the current study, also measured trait anxiety. There were no real differences, however between state and trait anxiety scores, indicating that using form X in addition to form Y in this study would have made no difference to the results. The inclusion of trait anxiety in a separate study by Stuart *et al.* (1998) essentially made no difference to their results. Although they did report a slight lowering of trait anxiety from 14-30 weeks (33.21 at 14 weeks to 33.02 at 30 weeks), this was not statistically significant.

## **Obsessional symptoms**

### Predicting obsessional behaviour

In the current study, the prenatal MOCI score predicted the postnatal MOCI score, with a large percentage of the variance accounted for at the postnatal stage. This large percentage perhaps reflects the trait stability of obsessionality as a construct. Rachman and Hodgson (1977) indicated in the original development of the MOCI, that the test's scores had robust test re-test reliability over 4 weeks in a non-clinical sample. Stoylen *et al.* (2000) suggest that the checking subscale explains 70 per cent of the variance in the scores. The current study did not separately assess each of the subscales and it may be that the results of the current study reflect the results of Stoylen *et al.* (2000).

Checking behaviour has been linked to increase perceived responsibility in the non-clinical (Overton, 2002) and OCD populations (Lopatka, 1995; Lopatka & Rachman, 1995; Overton, 2002). The arrival of an infant brings with it a huge responsibility

(Leckman *et al.*, 1999). Checking behaviour, if present before the birth, is unlikely to diminish postnatally, but either remains stable or possibly even increases. Much of the literature on postnatal onset OCD (Neiroglu *et al.*, 1992; Sichel *et al.*, 1993; Williams & Koran, 1997) does not give information regarding changes in the specific clinical behaviour of OCD patients after the baby is born, possibly because these studies use diagnostic criteria for OCD rather than continual measures. Maina *et al.* (1999) used the Y-BOCS in their study and found that those OCD women with postpartum onset had more checking behaviours than OCD women whose onset was related to other life events. A case series by Buttolph and Holland (1990) however, described an increase in washing rituals and contamination fears rather than checking behaviours. As with the studies by Neiroglu *et al.* (1992), Sichel *et al.* (1993) and Williams & Koran (1997), Buttolph and Holland (1990) did not use any measures of OCD symptoms. In non-clinical samples of parents, however, there also seems to be an increase of OCD type behaviours.

A prospective study by Leckman *et al.* (1999) did not assess the strength of prediction of obsessive behaviour before or after birth. However, the results from the Yale Inventory of Parental Thoughts and Actions (YIPTA; Leckman, Mayes, Feldman, Evans, King, & Cohen, 1994), indicated that washing behaviour increased postnatally in both mothers and fathers. Unfortunately, a search of Medline and PsycINFO databases produced no data on the standardisation of the YIPTA, or any of its psychometric properties. Therefore both the current and other studies suggest a predictable increase in OCD-type behaviours for non-clinical women postnatally.

However, whether this reflects an increase in washing, checking, or any other type of OCD behaviour is undecided.

#### Rates of obsessional behaviour

The mean MOCI score in the current sample of women was low at the prenatal (means = 3.50) and postnatal (mean = 4.16) assessment stages. However, the high and low scoring percentages at each stage show some trends. The percentage of high scorers ( $>8$ , 1 SD from the mean) increased from 8 per cent prenatally to 21 per cent postnatally. While this increase is a long way from a diagnosis of OCD, it does suggest an increase in obsessional behaviour. The subscale totals were not separately assessed, so the type of behaviour that increased cannot be commented upon. In psychiatric populations, pregnancy and childbirth has been associated with worsening of OCD symptoms (Williams & Koran, 1997), the onset of OCD problems (Buttolph & Holland, 1990; Nezirglu *et al.*, 1992), improvement in OCD (Williams & Koran, 1997) and occasionally with the termination of a pregnancy (Neziroglu *et al.*, 1992). Generally the studies have been retrospective and often distinction between pregnancy and the puerperium has not been made. For example when distinctions have been made in research, results have indicated that the process of actually giving birth, rather than pregnancy in general appears to be associated with the onset of OCD (Neziroglu *et al.*, 1992; Maina *et al.*, 1999). Also, differences appear when different methods of diagnosis have been used. One of the better retrospective designs by Maina *et al.* (1999) used scores on the Y-BOCS to diagnose OCD, as well as a diagnostic interview, and also set a criteria for onset of symptoms.

In the current study, none of the participant's had a diagnosis of OCD to the knowledge of the researcher, although they were never formally asked. The presentation of the project and the information sheet given out made it clear that a diagnosis of OCD would exclude them from the study. They were not assessed for a family history of OCD, although according to Maina *et al.* (1999), this would not have made a difference. In all cases, onset was postpartum or obsessional traits had appeared during the pregnancy of women who had a previous history of OCD. To explain the trend towards higher levels of obsessional behaviour in the current sample, research into the role of oxytocin in the development of OCD may be relevant. Leckman, Goodman, North, Chappell *et al.* (1994a, 1994b) found that subjects with OCD and no family history of OCD had higher levels of central spinal fluid oxytocin levels than those with other anxiety disorders or normal controls. Oxytocin, which is also released in high levels by the body during childbirth, is thought to mediate the extreme end of the range of normal behaviours, which are very similar to OCD. This would certainly make sense in terms of the increase in obsessional behaviours as measured by the MOCI. However, the oxytocin hypothesis is by no means a consensus in the literature. Altemus, Jacobson, Debellis, Kling, Pigott, Murphy and Gold (1999) have questioned these results by comparing OCD patients and normal controls and found no differences in oxytocin levels between these 2 groups. However, they did find that women in both groups had higher levels than men. The fact that the current study uses only women as participants, may explain the small increases in obsessionality in this sample. If oxytocin has even a small effect on obsessional behaviour, the large increase in the hormone coupled with the effect of gender possibly accounts for this result.

## STRENGTHS AND WEAKNESSES OF THE STUDY

### Strengths

This study benefited most by the strength of its prospective design and the choice of its non-clinical population. The prospective design allowed the women's intrusive thoughts and accompanying mood symptoms to be assessed at the third trimester of pregnancy and then postpartum at 4-6 weeks covering the window of vulnerability for symptoms of depression, anxiety, and obsessional behaviour to appear. Comment on these symptoms could then be made without the concern that the memory bias that is inherent in retrospective studies, would interfere in the interpretation of the results. Unlike many non-clinical studies, which recruit students as their sample, often with some academic reward, this study chose a group whose intrusions would be highly meaningful to them. This choice increases the chance that affect will be involved in this experience and the expectation is that the combination of the sample's thoughts and emotions is nearer the experience of those clinical groups who suffer from OCD (Gibbs, 1996).

The other strength of this study was the assessment of content *and* process characteristics of the intrusive thought. Identifying processes such as the uncontrollable and egodystonic nature of the thought helps the participant to distinguish between an intrusive thought and any other type of negative thought. This is especially relevant for thoughts that could be better classified as negative automatic thoughts, often found in depression and the type of worrisome thoughts that can be present for other anxiety disorders. Clark and Purdon (1995) argue that

identifying process characteristics will improve the discriminant validity of intrusive thoughts measures and allows us to more accurately investigate the differences between cognition and affect. The content of the thoughts under investigation in this study held significant personal meaning to the participants. Sometimes when this type of research is undertaken, the measures of intrusive thoughts contain pre-prepared lists of thoughts with seemingly typical content themes. Such pre-prepared thoughts are of much less interest, (Clark & Purdon, 1995) especially if the aim of the research is to study the association of thought with affect or to understand the escalation of normal intrusive thoughts into abnormal obsessions.

### **Weaknesses**

Several weaknesses limit the interpretations of the results of the current study. The demographics of the study may limit the generalisability of the findings to the population as a whole. The majority of the participants were white, middleclass, primaporous, university educated, married women in their 30's. Jennings *et al.* (1999) had suggested in their study of intrusive thoughts that demographic information had no bearing on the presence of the thoughts, however this can be accepted only with caution as the mere presence of the thought does not describe the experience of them. Subtle differences may appear in a culturally broader sample compared with this predominantly white group.

No concurrent variables such as marital satisfaction, wanted pregnancy, recent extraneous life events or family history of psychiatric disorder were assessed. Marital factors have been assessed as being important with regard to the levels of anxiety

experienced during the course of a pregnancy and as a potential predictor of PND (Da Costa *et al.*, 1999). Most of the sample in this study were married and informally portrayed that their partners were supportive of the pregnancy. Perhaps formal assessment may have revealed a group of pregnant women whose anxiety was low partly due to the support of their spouses. Whether the pregnancy was planned or not also has an impact on postpartum mood disorders. Da Costa *et al.* (2000) found that women who have postnatal depression were more likely to have an unplanned pregnancy than those who were not depressed. Most of this sample might have had positive outlooks about becoming mothers and this could have had a reducing effect on their postnatal depressive symptoms. Life events and family history of psychiatric illness are both significant in the development of pregnancy mood disorders (Maina *et al.*, 1999). Because neither of these was assessed in the current study, the effect of these variables on the levels of mood cannot be commented on. In general, conjecture suggests that this sample had very few vulnerability factors, for any significant levels of mood disturbance, to be found or consequently discussed.

Although the current study was prospective, it is possible the follow-up was not long enough to detect levels of real emotional distress in this sample. Stuart *et al.* (1998) found that a significant number of new cases of both anxiety and depression developed as late as 3 to 7 months postpartum. Although they suggest that the length of the postpartum period is controversial, clinicians should watch for symptoms to at least 30 weeks postnatally.



The small sample size limits the interpretation of the results related to predictors of PND and postnatal anxiety. Brace *et al.* (2003) notes that for results to be robust in regression analysis, the sample size should outnumber the criterion variables being measured by a minimum of 5:1. A more acceptable ratio would be 10:1 however they make an argument for as many as 40 participants to every one variable measured. While the current study meets the minimum criteria, the sample size is definitely a weak area for this type of analysis.

Probably the most limiting factor in the interpretation of these results was the use of a non-standardised measure for assessing the intrusive thoughts. The Likert scale for assessing the frequency, intensity and dismissability characteristics, was on a 4-point scale from zero to three. Rasmussen (1989) reports that the reliability of a test increases, with an increase in the number of scale points. The most dramatic increase was shown between a two and a three-point scale. Research has investigated which type of error (e.g. Type I or Type II) is more commonly associated with scaling differences. Investigations have demonstrated (Lunney, 1970; Myers, DiCecco, White & Borden, 1982; Seeger & Gabrielsson, 1968) that the number of scale points does not have a marked effect on the Type I error rate (finding significant results when there aren't any). The number of scale points, however, does affect the Type II error rate (finding no significance when there is). Cohen (1983) investigated the effect of the 2-point scale on power in correlational research. He demonstrated that using a 2-point scale for one variable instead of the original continuous scale resulted in a huge reduction in the variance accounted for by  $r^2$ . Rasmussen (1989) reported that this reduction was the equivalent to using the continuous scale and throwing out



38 per cent of the cases. With this research in mind, it seems that the choice of the 4-point scale is less likely to have produced a Type I error. It is more probable that the use of this scale missed significant results (Type II error).

Despite the less than optimal choice of the scale for assessing frequency, intensity and reliability of the thoughts, the scale analysis did indicate adequate levels of reliability within the scale. Intrusive thoughts questionnaires on a whole have not been used extensively in research studies. Clark and Purdon (1995) reported that a limited amount of psychometric data is available to determine their accuracy in assessing intrusive thoughts. Certainly Rachman and De Silva (1978) provide very little psychometric information for their early questionnaire. The internal reliability of the measure used in this study, pre and postnatally, compares well with that of Salkovskis and Harrison (1984) who reported an internal reliability coefficient of 0.80. More recent measures such as the Cognitive Intrusions Questionnaire (CIQ; Freeston *et al.*, 1992) used continuous scales to assess dimensions that included thoughts characteristics, as well as dimensions of subjective affect (sadness, worry, disapproval, guilt). Subjective negative emotion in relation to the thoughts in this current study was only recorded by its absence or presence, the dichotomous nature of which, quite probably missed some significant results. Nevertheless, the downside of the CIQ was that this measure also elicited most thoughts from a pre-prepared list, potentially reducing the personal meaning for the participant. With hindsight the author acknowledges that the combination of the personal interview that was carried out and measurement scales along more continuous lines, would have gathered the

highly relevant thoughts of interest in this study, while at the same time reducing the risk of a Type II error.

## **CLINICAL IMPLICATIONS**

Implications arising from this study concern both the psychiatric and non-psychiatric populations. For those clients with OCD, pregnancy may not just increase the vulnerability to or exacerbate the condition, but the content of the obsessions could be relevant to the current presentation of obsessions. Potentially there are other major life events, such as the death of a spouse or major illness that could be reflected in the content of their obsessions.

For this special group of the non-psychiatric population, the normalisation of these potentially very distressing thoughts appeared to be, anecdotally, very reassuring. Psychological counselling in pregnancy is limited to sporadic assessment of postnatal depression. Midwives and other health professionals are seemingly unaware of the many different cognitive events that can occur in non-psychiatric women during pregnancy and after the infant is born. Distress could be alleviated simply by acknowledgement that these thoughts may occur and that they are very common but are no reflection on the woman's ability to care for her infant and are not predictive of any tragic events actually occurring.

## **FUTURE RESEARCH**

Future research into intrusive thoughts in non-clinical populations should aim to be prospective in design perhaps with a view to studying vulnerability factors in

conjunction with the thoughts. This method will possibly be more successful in identifying certain individuals who go on to develop full-blown clinical syndromes. Future studies should focus on the development of standardised questionnaires to measure intrusive thoughts in non-clinical populations. These scales should assess process characteristics in addition to the content of the thoughts; this will increase discriminant validity of the cognitive event being measured. The choice of the participants for future studies should try and limit the number of students used and target separate types of groups in the general population. To this author's knowledge, there are no studies, which take into account cultural issues in the experience of intrusive thoughts. Simply recording that the demographic variable of race does not affect the results of the study does not capture the finer process characteristics of the thoughts, or the beliefs about their existence.

## References

- Abramowitz, J.S. & Foa, E.B. (1998). Worries and obsessions in individuals with obsessive-compulsive disorder with and without generalised anxiety disorder. *Behaviour Research and Therapy*, 36, 695-700.
- Abramowitz, J.S., Schwatz, S.A., Moore, K., & Luenzmann, K.R. (2003a). Obsessive-compulsive symptoms in pregnancy and the puerperium: a review of the literature. *Journal of Anxiety Disorders*, 17, 461-478.
- Abramowitz, J.S., Schwartz, S.A. & Moore, K.M. (2003b). Obsessional thoughts in postpartum females and their partners: content, severity and relationship with depression. *Journal of Clinical Psychology in Medical Settings*, 10(3), 157-164.
- Altemus, M., Jacobson, K. R., Debellis, M., Kling, M., Pigott, T., Murphy, D. L. & Gold, P.W. (1999). Normal CSF oxytocin and NPY levels in OCD. *Biological Psychiatry*. 45(7), 931-933.
- Altshuler, L.L., Hendrick, V. & Cohen, L.S. (1998). Course of mood and anxiety disorders during pregnancy and the postpartum period. *Journal of Clinical Psychiatry*, 59, 29-33.
- American Psychiatric Association (1980). *Diagnostic and Statistical Manual of Mental Disorders*. (3<sup>rd</sup> edn revised). Washington D.C: American Psychiatric Association.
- American Psychiatric Association (1987). *Diagnostic and Statistical Manual of Mental Disorders*. (3<sup>rd</sup> edn revised). Washington D.C: American Psychiatric Association.
- American Psychiatric Association (1994). *Diagnostic and Statistical Manual of Mental Disorders*. (4<sup>th</sup> edn). Washington D.C: American Psychiatric Association.

Arizmendi, T.G. & Alfonso, D.D. (1987). Stressful events related to pregnancy and postpartum. *Journal of Psychosomatic Research*, 31, 757-764.

Astbury, J., Brown, S. & Small, R. (1995). Birth events, birth experiences and social differences in postnatal depression. *Australian Journal of Public Health*, 18(2), 176-184.

Ayers, S. (2003). Commentary on "Post-traumatic stress following childbirth: a review of the emerging literature and directions for research and practice. *Psychology, Health and Medicine*, 8(2), 169-171.

Ayers, S. & Pickering, A.D. (2001). Do women get post-traumatic stress disorder as result of childbirth? A prospective study of incidence. *Birth*, 28(2), 111-118.

Ballard, C.G., Stanley, A.K. & Brockington, I.F. (1995). Post-traumatic stress disorder (PTSD) after childbirth. *British Journal of Psychiatry*, 166(4), 525-528.

Bareggi, S.R., Bianchi, L., Cavallaro, R., Gervasoni, M., Siliprandi, F. & Bellodi, L. (2004). Citalopram concentrations and response in obsessive-compulsive disorder. Preliminary results. *CNS Drugs*, 18(5), 329-35.

Beck, A.T. (1967). *Depression, Clinical, Experimental and Theoretical Aspects*. New York: Hoeber. (Republished as *Depression: Causes and Treatment*. Philadelphia: University of Pennsylvania Press, 1972)

Beck, A.T. & Steer, R.A. (1993). *Manual for the Beck Anxiety Inventory*. San Antonio: The Psychological Corporation.

Beck, A.T., Steer, R.A. & Brown, G.K. (1993). *Manual for the Beck Depression Inventory*. San Antonio: The Psychological Corporation

Beck, A.T., Ward, C.H., Mendelson, M., Mock, J. & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, 4, 561-571.

Beck, C.T. (2001). Predictors of postpartum depression: an update. *Nursing Research*, 50(5), 275-285.

Bernazzani, O., Saucier, J.F., David, H. & Borgeat, F. (1997). Psychosocial predictors of depressive symptomatology level in postpartum women. *Journal of Affective Disorders*, 46, 39-49.

Black, D.W., Goldstein, R.B., Noyles, Jr. R. & Blum, N. (1995). Psychiatric disorders in relatives of probands with obsessive-compulsive disorder and co-morbid major depression or generalised anxiety. *Psychiatric Genetics*, 5, 37-41.

Brace, N., Kemp, R. & Snelgar, R. (2003). *SPSS for Psychologists. A Guide to Data Analysis using SPSS for Windows*. (2<sup>nd</sup> ed.) p212, Palgrave MacMillan: New York.

Brouwers, E.P.M., Van Baar, A. L. & Pop, V.J.M. (2001). Maternal anxiety during pregnancy and subsequent infant development. *Infant Behaviour and Development*, 24(1), 95-106.

Brugha, T.S., Sharp, H.M., Cooper, S.A., Weisender, C., Britto, D., Shinkwin, R., Sherrif, T. & Kirwin, P.H. (1998). The Leicester 500 Project. Social support and the development of postnatal depressive symptoms, a prospective cohort survey. *Psychological Medicine*, 28(1), 63-79.

Burns, G.L., Formea, G.M., Keortge, S. & Sternberger, L.G. (1995). The utilisation of non-patient samples in the study of obsessive-compulsive disorder. *Behaviour Research and Therapy*, 33, 133-144.

Burnstein, I., Kinch, R.A.H. & Stern, L. (1974). Anxiety, pregnancy, labour and the neonate. *American Journal of Obstetrics and Gynaecology*, 118, 195-199.

Buttolph, M.L. & Holland, A.D. (1990). Obsessive-compulsive disorders in pregnancy and childbirth. In M. Jenike, L. Baer, & W. Minichiello (Eds.), *Obsessive Compulsive Disorders: Theory and Management* (pp. 89-97). Chicago: Year Book Medical.

Campbell, S.B. & Cohn, J.F. (1991). Prevalence and correlates of postpartum depression in first-time mothers. *Journal of Abnormal Psychology*, 100, 594-599.

Carothers, A.D. & Murray, L. (1990). Estimating psychiatric morbidity by logistic regression: Application to post-natal depression in a community sample. *Psychological Medicine*, 20(3), 695-702.

Chavira, D.A., Stein, M.B., Bailey, K. & Stein, M.T. (2004). Comorbidity of generalized social anxiety disorder and depression in a paediatric primary care sample. *Journal of Affective Disorders*, 80(2-3), 163-71.

Clark, D.A. & Claybourn, M. (1997). Process characteristics of worry and obsessive intrusive thoughts. *Behaviour Research & Therapy*, 35(12), 1139-1141.

Clark-Carter, D. (1997). *Doing Quantitative Psychological Research: From Design to Report*. Psychological Press, Hove; East Sussex.

Clark, D.A. & De Silva, P. (1985). The nature of depressive and anxious intrusive thoughts: distinct or uniform phenomena? *Behaviour Research and Therapy*, 23(4), 383-393.

Clark, D.A. & Hemsley, D.R. (1985). Individual differences in the experience of depressive and anxious, intrusive thoughts. *Behaviour Research and Therapy*, 23(6), 625-633.

- Clark, D.A. & Nikki, R.M. (1989). Frequency as a moderating variable in self-report measures of negative cognition. *Behaviour Research and Therapy*, 27, 475-478.
- Clark, D.A. & Purdon, C.L. (1995). The assessment of unwanted intrusive thoughts: a review and critique of the literature. *Behaviour Research and Therapy*, 33(8), 967-976.
- Chan, D.W. (1990). The Maudsley Obsessional Compulsive Inventory: A psychometric investigation on Chinese normal subjects. *Behaviour Research and Therapy*, 28, 413-420.
- Cohen, J. (1969). *Statistical Power Analysis for the Behavioural Sciences*. San Diego, CA: Academic Press.
- Cohen, J. (1983). The cost of dichotomization. *Applied Psychological Measurement*, 7(3), 249-253.
- Cohen, J. (1992). Quantitative methods in psychology: a power primer. *Psychological Bulletin*, 112(1), 155-159.
- Cooper, J. & McNeil, J. (1968). A study of house-proud housewives and their interaction with their children. *Journal of Child Psychology and Psychiatry*, 9, 173-188.
- Cooper, P.J., Murray, L. & Stein, A. (1991). Postnatal depression. In: A. Seva (ed.) *European Handbook of Psychiatry and Mental Health*, pp. 1255-1262, Zaragoza, Spain.
- Cowan, P.A. & Cowan, C.P. (1988). Changes in marriage during the transition to parenthood: Must we blame the baby? In G.Y. Michaels & W.A. Goldberg (eds.), *The Transition to Parenthood*. Pp. 114-156, Cambridge University Press, Cambridge.



Cox, J.L., Holden, J.M. & Sagovsky, R. (1987). Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*, 150, 782-786.

Cox, J.L., Murray, D. & Chapman, G. (1993). A controlled study of the onset, duration and prevalence of postnatal depression. *British Journal of Psychiatry*, 163, 27-31.

Creedy, D.K., Shocket, I.M. & Horsfall, J. (2000). Childbirth and the development of acute trauma symptoms: incidence and contributing factors. *Birth*, 27(2), 104-111.

Crino, R.D. & Andrews, G. (1996). Obsessive-compulsive disorder and axis 1 comorbidity. *Journal of Anxiety Disorders*, 10, 37-46.

Crisp, A.H., Jones, M.G. & Slater, P. (1978). The Middlesex Hospital Questionnaire; a validity study. *British Journal of Medical Psychology*, 51, 269-280.

Da Costa, D., Larouche, J., Drista, M. & Brender, W. (1999). Variations in stress levels over the course of pregnancy: factors associated with elevated hassles, state anxiety and pregnancy specific stress. *Journal of Psychosomatic Research*, 47(6), 609-621.

Da Costa, D., Larouche, J., Drista, M. & Brender, W. (2000). Psychosocial correlates of prepartum and postpartum depressed mood. *Journal of Affective Disorders*, 59(1), 31-40.

Dennis, C. (2004). Can we identify mothers at risk for postpartum depression in the immediate postpartum period using the Edinburgh Postnatal Depression Scale? *Journal of Affective Disorders*, 78(2), 163-169.

Derogatis, L. R. (1983). *SCL-90-R: Administration, scoring and procedures manual* (2<sup>nd</sup> ed.). Clinical Psychometrics Research. Baltimore, MD.

Derogatis, L.R., Lipmann, R.S., Rickels, K., Uhlenhuth, E.H. & Covi, L. (1974). The Hopkins Symptom Checklist (HSCL). A measure of primary symptoms dimensions. *Pharmacopsychiatry*, 7, 79-110.

De Silva, P. & Marks, M. (2001). Traumatic experience, post-traumatic stress disorder and obsessive compulsive disorder. *International Review of Psychiatry*, 13, 172-180.

De Silva, P. & Rachman, S. (1992). *Obsessive-compulsive disorder: The facts*. Oxford University Press: Oxford.

Dunkel-Schetter, C., (1998). Maternal stress and preterm delivery. *Prenatal and Neonatal Medicine*, 3, 39-42.

Edwards, S. & Dickerson, M. (1987a). Intrusive unwanted thoughts: a two-stage model of control. *British Journal of Medical Psychology*, 60, 317-328.

Edwards, S, & Dickerson, M. (1987b). On the similarity of positive and negative intrusions. *Behaviour Research and Therapy*, 25(3), 207-211.

Ehlers, A. & Clark, D.M. (2000). A cognitive model of post-traumatic stress disorder. *Behaviour Research and Therapy*, 38, 319-345.

Ehrenkranz, J.R.L. (1976). Effects of sex steroids on Serotonin uptake in blood platelets. *Acta Endocrinologica*, 83, 420-428.

Engelhard, I.M., Van Rij, M., Boullart, I., Ekhart, T.H.A., Spaanderman, M.E.A., Van den Hout, M.A. & Peeters, L.L.H. (2002). Post-traumatic stress disorder after pre-eclampsia: an exploratory study. *General Hospital Psychiatry*, 24(4), 260-264.

Fernandez, R.J. (1992). Recent clinical management experience. In J.A. Hamilton & P.N. Harberger, (Eds.), *Post partum Psychiatric illness: A Picture Puzzle*. University of Pennsylvania Press, Philadelphia.

Frankl, V.E. (1960). Paradoxical intention: a logotherapeutic technique. *American Journal of Psychotherapy*, 14, 520-535.

Freeston, M.H. & Ladouceur, R. (1993). Appraisal of cognitive intrusions and response style; replication and extension. *Behaviour Research and Therapy*, 31, 181-191.

Freeston, M.H., Ladouceur, R., Thibodeau, N. & Gagnon, F. (1991). Cognitive intrusions in a non-clinical population 1: response style, subjective experience and appraisal. *Behaviour Research and Therapy*, 29, 585-597.

Freeston, M.H., Ladouceur, R., Thibodeau, N. & Gagnon, F. (1992). Cognitive intrusions in a non-clinical population 2: Associations with depressive, anxious and compulsive symptoms. *Behaviour Research and Therapy*, 30, 260-271.

Fydrich, T., Dowdall, D. & Chambless, D. L. (1992). Reliability and validity of the Beck Anxiety Inventory. *Journal of Anxiety Disorders*, 6(1), 55-61.

Ganong, W.F. (1991). Physiology of reproduction. In M.L. Pernoll, (ed.), *Current Obstetric and Gynaecologic Diagnosis and Treatment*, 7<sup>th</sup> Edition. Pp. 122-141. Appleton and Lange, Norwalk.

Geller, D.A., Biederman, J., Stewart, S.E., Mullin, B., Martin, A., Spencer, T. & Faraone, S.V. (2003). Which SSRI? A meta-analysis of pharmacotherapy trials in pediatric obsessive-compulsive disorder. *American Journal of Psychiatry*, 160(11), 19-28.

Gibbs, N.A. (1996). Non-clinical populations in research on obsessive-compulsive disorders: a critical review. *Clinical Psychology Review*, 16, 729-773.

Goldman, S. & Owen, S.L. (1994). The impact on the utilisation of health care services in infancy: a prospective study. *Journal of Paediatric Psychology*, 19, 369-381.

Goodman, W.K., Price, L.H., Rasmussen, S.A., Mazure, C., Fleischmann, R.L., Hill, C.L., Heniger, G.R. & Charney, D.S. (1989a). The Yale-Brown Obsessive Compulsive Scale1. Development, use and reliability. *Archives of General Psychiatry*, 46, 1006-1011.

Goodman, W.K., Price, L.H., Rasmussen, S.A., Mazure, C., Delgado, P., Heniger, G.R. & Charney, D.S. (1989b). The Yale-Brown Obsessive Compulsive Scale 2. Validity. *Archives of General Psychiatry*, 46, 1012-1016.

Goodman, W.K., Rasmussen, S.A., Price, L.H., Mazure, C., Heniger, G.R. & Charney, D.S. (1989c). *Manual for the Yale-Brown Obsessive-Compulsive Scale* (rev.). Connecticut Mental Health Centre. Newhaven, CT;

Gotlib, I.H., Whiffen, V.E., Wallace, P.M. & Mount, J.H. (1991). Prospective investigation of postpartum depression: factors involved in onset and recovery. *Journal of Abnormal Psychology*, 100(2), 122-132.

Harris, B., Huckle, P., Thomas, R., Johns, S. *et al.* (1989). The use of rating scales to identify postnatal depression. *British Journal of Psychiatry*, 154, 813-817.

Hayworth, J., Little, B.C., Carter, S.B., Raptopoulos, P. Priest, R.G. & Sandler, M. (1980). A prospective study of postpartum depression: some predisposing characteristics. *British Journal of Medical Psychology*, 53, 161-167.

Heron, J., O'Connor, T.G., Evans, J., Golding, J. & Glover, V. (2003). The course of anxiety and depression through pregnancy and the postpartum in a community sample. *Journal of Affective Disorders*, 80(1), 65-73.

Hodgson, R. & Rachman, S. (1977). Obsessional compulsive complaints. *Behaviour Research and Therapy*, 15, 389-395.

Honey, K.L., Bennett, P. & Morgan, M. (2003). Predicting postnatal depression. *Journal of Affective Disorders*, 76, 201-210.

Howell, D.C. (1997). *Statistical Methods for Psychology* (4<sup>th</sup> edition). Wadsworth Publishing Company, Belmont; CA.

Insel, T.R., Zahn, T.P. & Murphy, D.L. (1985). Obsessive-compulsive disorder: an anxiety disorder? In T.A. Hussein & J.D. Maser (Eds.), *Anxiety and the Anxiety Disorders*, (pp. 577-589). Lawrence Erlbaum Associates, Inc. Hillsdale, NJ, England.

Istvan, J. (1986). Stress, anxiety and birth outcomes: a critical review of the evidence. *Psychological Bulletin*, 100, 331-348.

Jennings, K.D., Ross, S., Popper, S. & Elmore, M. (1999). Thoughts of harming infants in depressed and non-depressed mothers. *Journal of Affective Disorders*, 54, 21-28.

Johnstone, S.J., Boyce, P.M., Hickey, A.R., Morris-Yates, A.D. & Harris, M.G. (2001). Obstetric risk factors for postnatal depression in urban and rural community samples. *Australia and New Zealand Journal of Psychiatry*, 35, 69-74.

Kalil, K.M., Gruber, J.E., Conley, J. & Sytniac, M. (1993). Social and family pressure on anxiety and stress during pregnancy. *Journal of Pre-Perinatal Psychology*, 8, 113-118.

Kraaijkamp, H.J.M., Emmelkamp, P.M.G. & Van den Hout, M.A. (1986). *The Maudsley Obsessional-Compulsive Inventory: Reliability and validity*. Unpublished manuscript, Department of Clinical Psychology, University of Groningen, The Netherlands.

Kumar, R. & Brockington, I.F. (1988). *Motherhood and Mental Illness 2: Causes and Consequences*. Wright: London.

Kumar, R. & Robson, K.M. (1984). A prospective study of emotional disorders in childbearing women. *British Journal of Psychiatry*, 144, 35-47.

Kumar, R., Robson, K.M. & Smith, A.M.R. (1984). Development of a self-administered questionnaire to measure maternal adjustment and maternal attitudes during pregnancy and after delivery. *Journal of Psychosomatic Research*, 28, 43-51.

Ladouceur, R., Freeston, M.H., Rheaume, J., Dugas, M.J., Gagnon, F., Thibodeau, N. & Fournier, S. (2000). Strategies used with intrusive thoughts: A comparison of OCD patients with anxious and community controls. *Journal of Abnormal Psychology*, 109(2), 179-187.

Langlois, F., Freeston, M.H. & Ladouceur, R. (2000a). Differences and similarities between obsessive intrusive thoughts and worry in a non-clinical population: study 1. *Behaviour Research and Therapy*, 38, 2, 157-173.

Langlois, F., Freeston, M.H. & Ladouceur, R. (2000b). Differences and similarities between obsessive intrusive thoughts and worry in a non-clinical population: study 2. *Behaviour Research and Therapy*, 38, 2, 175-189.

Leckman, J.F., Goodman, W.K., North, W.G., Chappell, P.B., *et al.* (1994a). The role of central oxytocin in obsessive-compulsive disorder and related normal behaviour. *Psychoneuroendocrinology*. 19(8), 723-749.

Leckman, J. F., Goodman, W.K., North, W.G., Chappell, P.B. *et al.* (1994b). Elevated cerebrospinal fluid levels of oxytocin in obsessive-compulsive disorder: Comparison with Tourette's syndrome and healthy controls. *Archives of General Psychiatry*. 51(10), 782-792.

Leckman, J.F., Mayes, L.C., Feldman, R., Evans, D., King, R.A. & Cohen, D.J. (1994). *Yale Inventory of Parental Thoughts and Actions*. Yale University, New Haven, CT.

Leckman, J.F., Mayes, L.C., Feldman, R., Evans, D.W., King, R.A. & Cohen, D.J. (1999). Early parental preoccupations and behaviours and their possible relationship to the symptoms of obsessive-compulsive disorder. *Acta Psychiatrica Scandinavica*, 100, 396, 1-26.

Lederman, R.P. (1996). *Psychosocial Adaptation in Pregnancy: Assessment of Seven Dimensions of Maternal Development*. [2<sup>nd</sup> edition]. University of Pennsylvania Press, Philadelphia.

Lee, D.T., Yip, A.S., Leung, T.Y. & Chung, T.K. (2000). Identifying women at risk of postnatal depression; prospective longitudinal study. *Hong Kong Medical Journal*, 6, 349-354.

Lenze, E.J. (2003). Comorbidity of depression and anxiety in the elderly. *Current Psychiatry Reports*, 5(1), 62-67.

Levin, J.S. (1991). The factor structure of the pregnancy anxiety scale. *Journal of Health and Social Behaviour*, 32, 368-381.

Lobel, M. (1994). Conceptualisations, measurement and effects of prenatal maternal stress on birth outcomes. *Journal of Behavioural Medicine*, 17, 225-272.

Lobel, M., Dunkel-Schetter, C., & Scrimshaw, S.C.M. (1992). Prenatal maternal stress and prematurity: A prospective study of socioeconomically disadvantaged women. *Health Psychology*, 11, 32-40.

Lopatka, C. (1995). Responsibility in obsessive-compulsive disorder: Is it worth checking? *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 55(8-B), 3593.

Lopatka, C. & Rachman, S.J. (1995). Perceived responsibility and compulsive checking: an experimental analysis. *Behaviour Research and Therapy*, 33, 673-684.

Lunney, G.H. (1970). Using analysis of variance with a dichotomous dependent variable: an empirical study. *Journal of Educational Measurement*, 7, 263-269.

Lynch, T.R. (1996). *Conflict and intimacy in couple relationships as predictors of depressed mood in women following the birth of a child*. Unpublished Doctoral Dissertation, Kent State University, Kent Ohio.

Lyons, J., Keane, T. & Keane, S. (1992). Post-traumatic stress disorder scale: MMPI and MMPI-2 update. *Journal of Trauma and Stress*, 5, 111-117.

Maier, W. & Falkai, P. (1999). The epidemiology of co morbidity between depression, anxiety disorders and somatic diseases. *International Clinical Psychopharmacology*. 14(Suppl 2), S1-6.

Maina, G., Albert, U., Bogetto, P.V., Vaschetto, P. & Ravizza, L. (1999). Recent life events and obsessive-compulsive disorder: the role of pregnancy/delivery. *Psychiatry Research*, 89(1), 49-58.

Matthey, S., Barnett, B., Howie, P. & Kavanagh, D.J. (2003). Diagnosing postpartum depression in mothers and fathers: Whatever happened to anxiety? *Journal of Affective Disorders*, 74(2), 139-147.



Matthey, S., Barnett, B., Ungerer, J. & Waters, B. (2000). Paternal and maternal depressed mood during the transition to parenthood. *Journal of Affective Disorders*, 60(2), 75-85.

McNair, D.M., Lorr, M. & Droppleman, L.F. (1971). *Profile of Mood States Manual*. Educational and Industrial Testing Service. San Diego, California.

Metz, A., Sichel, D.A. & Goff, D.C. (1988). Postpartum panic disorder. *Journal of Clinical Psychiatry*, 49, 278-279.

Metzger, R.L. (1976). A reliability study of the State-Trait Anxiety Inventory. *Journal of Clinical Psychology*, 32(2), 276-278.

Millis, J.B. & Kornblith, P.R. (1992). Fragile beginnings: identification of postpartum disorders. *Health and Social Work*, 17(3), 192-199.

Montgomery, S.A. (1993). Obsessive-compulsive disorder is not an anxiety disorder. *International Clinical Psychopharmacology*, 8, 57-62.

Moore, P.J. (1991). Physiology of reproduction. In M.L. Pernoll, (ed.), *Current Obstetric and Gynaecologic Diagnosis and Treatment*, 7<sup>th</sup> Edition. Pp. 122-141. Norwalk, Appleton and Lange.

Murray, L., Fiori-Cowley, A., Hooper, R. & Cooper, P.J. (1996). The impact of postnatal depression and associated adversity on early mother-infant interactions and later infant outcome. *Child Development*, 67, 2512-2526.

Myers, J.L., DiCecco, J.V., White, J.B. & Borden, V.M. (1982). Repeated measures on dichotomous variables: *Q* and *F* tests. *Psychological Bulletin*, 92, 269-277.

Nestadt, G., Samuels, J., Riddle, M.A., Liang, K.Y., Bienvenu, O.J., Hoehn, S.R., Grados, M. & Cullen, B. (2001). The relationship between obsessive-compulsive disorder and anxiety and affective disorders: results from the Johns Hopkins OCD family study. *Psychological Medicine*, 31,3, 48-487.

Neziroglu, F., Anemone, R. & Yaryura-Tobias, J. (1992). Onset of obsessive-compulsive disorder in pregnancy. *American Journal of Psychiatry*, 149, 947-950.

Niler, E.R. & Beck, S.J. (1989). The relationship among guilt, dysphoria, anxiety and obsessions in a normal population. *Behaviour, Research and Therapy*, 27, 3, 213-220.

O'Hara, M.W. & Swain, A.M. (1996). Rates and risk of postpartum depression: a meta-analysis. *International Review of Psychiatry*, 8, 37-54.

O'Hara, M.W., Zekoski, E.M., Philipps, L.H. & Wright, E.J. (1990). Controlled prospective study of postpartum mood disorders: Comparison of childbearing and non-childbearing women. *Journal of Abnormal Psychology*, 99(1), 3-15.

O'Neill, T., Murphy, P. & Greene, V.T. (1990). Postnatal depression--aetiological factors. *Irish Medical Journal*, 83(1), 17-28.

Overton, S.M. & Menzies, R.G. (2002). A comparison of checking-related beliefs in individuals with obsessive-compulsive disorder and normal controls. *Journal Behaviour Change*, 19(2), 67-74.

Parkinson, L. & Rachman, S.J. (1981). Part II: The nature of intrusive thoughts. *Advanced Behaviour Research and Therapy*, 3, 101-110.

Patel, V., Rodrigues, M. & DeSouza, N. (2002). Gender, poverty and postnatal depression: a study of mothers in Goa, India. *American Journal of Psychiatry*, 159, 43-47.

Pleschette, N., Asch, S.S. & Chase, J. (1956). A study of anxieties during pregnancy, labour, the early and late puerperium. *Bulletin of the New York Academy of Medicine*, 32, 436-455.

Pitt, B. (1985). Postpartum disorders. In R.G. Priest (ed.) *Psychological Disorders in Obstetrics and Gynaecology*. Butterworths, London.

Powell, S.S. & Drotar, D. (1992). Postpartum depressed mood – the impact of daily hassles. *Journal of Psychosomatic Obstetrics and Gynaecology*, 13, 255-266.

Rachman, S.J. (1978). An anatomy of obsessions. *Behavioural Analysis Modification*, 2, 253-278.

Rachman, S.J. (1981). Special issue on unwanted intrusive cognitions. *Advances in Behaviour Therapy*, 3, 87-123.

Rachman, S. (1993). Obsessions responsibility and guilt. *Behaviour Research and Therapy*, 31, 2, 149-154.

Rachman, S.J. & De Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy*, 16, 233-248.

Rachman, S.J. & Hodgson, R. (1980). *Obsessions and Compulsions*. Prentice Hall. Englewood Cliffs, N.J.

Radloff, L.S. (1977). The CES-D Scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

Ralph, K. & Alexander, J. (1994). Borne under stress. *Nursing Times*, 90, 28-30.

Rasmussen, J.L. (1989). Analysis of Likert-scale data: a reinterpretation of Gregoire and Driver. *Psychological Bulletin*, 105(1), 167-170.

Reed, G.F. (1985). *Obsessional Experiences and Compulsive Behaviour: A Cognitive Structural Approach*. Academic Press, Orlando, Fla.

Regier, D.A., Boyd, J.H., Burke, J.D., Rae, D.S., Myers, J.K., Kramer, M., Robins, L.N., George, L.K., Karno, M. & Locke, B.Z. (1988). One-month prevalence of mental disorders in the United States. *Archives of General Psychiatry*, 45, 977-986.

Resnick, P.L. (1969). Child murder by parents: a psychiatric review of filicide. *American Journal of Psychiatry*, 126, (3), 325-334.

Reynolds, M. & Brewin, C.R. (1998). Intrusive cognitions, coping strategies and emotional responses in depression, post traumatic stress disorder and a non-clinical population. *Behaviour Research and Therapy*, 36, 135-147.

Reynolds, M. & Salkovskis, P.M. (1991). The relationship among guilt, dysphoria, anxiety and obsessions in a normal population-an attempted replication. *Behaviour Research and Therapy*, 29, 3, 259-265.

Ricciardi, J.N. & McNally, R.J. (1995). Depressed mood is related to obsessions, but not to compulsions, in obsessive-compulsive disorder. *Journal of Anxiety Disorders*, 9(3), 249-256.

Righetti-Veltma, M., Conne-Perreard, E., Bousquet, A. & Manzano, J. (1998). Risk factors and predictive signs of postpartum depression. *Journal of Affective Disorders*, 49(3), 167-180.

Rini, C.K., Dunkel-Schetter, C., Wadhwa, P.D. & Sandman, C.A. (1999). Psychological adaptation and birth outcomes: The role of personal resources, stress and sociocultural context in pregnancy. *Health Psychology*, 18(4), 333-345.

Robertson, E., Grace, S., Wallington, T. & Stewart, D.E. (2004). Antenatal risk factors for postpartum depression: a synthesis of recent literature. *General Hospital Psychiatry*, 26(4), 289-295.

Rodney J., Prior, N., Cooper, B., Theodoros, M., Browning, J., Steinberg, B. & Evans, L. (1997). The comorbidity of anxiety and depression. *Australian & New Zealand Journal of Psychiatry*, 31(5), 700-703.

Rule, W. & Traver, M.D. (1983). Test-retest reliabilities of the State-Trait Anxiety Inventory in a stressful social analogue situation. *Journal of Personality Assessment*, 47(3), 276-277.

Salkovskis, P.M. (1985). Obsessional-compulsive problems: a cognitive behavioural analysis. *Behaviour Research and Therapy*, 23, 5, 571-583.

Salkovskis, P.M. (1989). Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research & Therapy*, 27(6), 677-682.

Salkovskis, P.M. & Harrison, J. (1984). Abnormal and normal obsessions – a replication. *Behaviour Research and Therapy*, 22, (5) 549-552.

Salkovskis, P.M., Shafran, R., Rachman, S. & Freeston, M.H. (1999). Multiple pathways to inflated responsibility beliefs in obsessional problems: possible origins and implications for therapy and research. *Behaviour Research and Therapy*, 37, 1055-1072.

Sanavio, E. (1988). Obsessions and compulsions: The Padua Inventory. *Behaviour Research and Therapy*, 26, 2, 169-177.

Sanavio, E. & Vidotto, G. (1985). The components of the Maudsley Obsessional-Compulsive questionnaire. *Behaviour Research and Therapy*, 23, 659-662.

Seeger, P. & Gabrielsson, A. (1968). Applicability of Cochran  $Q$  and the  $F$  test for statistical analysis of dichotomous data for dependant samples. *Psychological Bulletin*, 69, 269-277.

Seguin, L., Potvin, L., St Denis, M. & Loiselle, J. (1999). Depressive symptoms in the late postpartum among low socio-economic status women. *Birth*, 26, 157-163.

Seligman, M. (1975). Helplessness. W.H. Freeman, San Francisco.

Shear, M.K. & Oommen-Mammen, M.D. (1995). Anxiety disorders in pregnant and post partum women. *Psychopharmacological Bulletin*, 31, (4) 693-703.

Sholomskas, D.E., Wickamaratne, P.J., Dogolo, L. & O'Brien, D.W. (1994). Postpartum onset of panic disorder: A coincidental event? *Journal of Clinical Psychiatry*, 54(12), 476-480.

Sichel, D.A., Cohen, L.S., Dimmock, J.A. & Rosenbaum, J.F. (1993a). Post partum obsessive-compulsive disorder: a case series. *Journal of Clinical Psychiatry*, 54, 156-159.

Sichel, D.A., Cohen, L.S., Rosenbaum, J.F. & Driscoll, J.D. (1993b). Post partum onset of obsessive-compulsive disorder. *Psychosomatics*, 34, 277-279.

Sjoestroem, K., Thelin, T., Marsal, K. & Valentin, L. (2003). Effects of maternal anxiety on perception of foetal movements in late pregnancy. *Early Human Development*, 72(2), 111-122.

Spanier, G.B. (1976). Measuring dyadic adjustment; new scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and Family*, 38, 15-28.

Spencer, N. (2001). The social patterning of teenage pregnancy. *Journal of Epidemiology and Community Health*, 55(1), 5-8.

Spielberger, C.D., Gorsuch, R.L. & Lushene, R.E. (1970). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologist Press.

Standley, K., Soule, B. & Copans, S.A. (1978). Dimensions of prenatal anxiety and their influence on pregnancy outcome. *American Journal of Obstetrics*, 135, 22-26.

Stein, A., Gath, D.H., Butcher, J. Bond, A., Day, A. & Cooper, P.J. (1991). The relationship between postnatal depression and mother-child interaction. *British Journal of Psychiatry*, 158, 46-52..

Stoylen, I.J., Larsen, S. & Kvale, G. (2000). The Maudsley Obsessional-Compulsive Inventory and OCD in a Norwegian non-clinical sample. *Scandinavian Journal of Psychology*, 41(4), 283-286.

Stuart, S., Couser, G., Schilder, K., O'Hara, M.W. & Gorman, L. (1998). Postpartum anxiety and depression: Onset and co-morbidity in a community sample. *Journal of Nervous and Mental Disease*, 186(7), 420-424.

Surtees, P.G. & Miller, P.McC. (1990). The interval General Health Questionnaire. *British Journal of Psychiatry*, 157, 686-693.

Sutherland, G., Newman, B. & Rachman, S.J. (1982). Experimental investigations of the relations between mood and intrusive unwanted cognitions. *British Journal of Medical Psychology*, 55, 127-138.

Teasdale, J. (1983). Negative thinking in depression: cause, effect or reciprocal relationship? *Advances in Behaviour Research and Therapy*, 5, 3-25.

Teasdale, J. & Clark, D. (1981) Personal Communication.

Teasdale, J. & Fogarty, S. (1979). Differential effects of induced mood on retrieval of pleasant and unpleasant events from episodic memory. *Journal of Abnormal Psychology*, 88, 248-257.

Thompson, L.M., Murphy, P., O'Hara, J. and Wallymahmed, A. (1997). Levels of daily hassles and uplifts in employed and non-employed women. *Journal of Reproductive Infant Psychology*, 15, 271-280.

Trad, P.V. (1994). Intensive didactic short-term psychotherapy for post partum panic disorder. *International Journal of Short-term Psychotherapy*, 9(1), 37-59.

Turner, S.M., Beidel, D.C. & Stanley, M.A. (1992). Are obsessional thoughts and worry different cognitive phenomena? *Clinical Psychology Review*, 12, 257-270.

Van den Bergh, B.R.H. (1990). The influences of maternal emotions during pregnancy on foetal and neonatal behaviour. *Pre and Perinatal Psychology*, 5, 119-130.

Van den Bergh, B.R.H. & Marcoen, A. (2004). High Antenatal Maternal Anxiety Is Related to ADHD Symptoms, Externalizing Problems, and Anxiety in 8- and 9-Year-Olds. *Child Development*, 75(4), 1085-1097.

Vaswani, M., Linda, F.K. & Ramesh, S. (2003). Role of selective serotonin reuptake inhibitors in psychiatric disorders: a comprehensive review. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, 27(1), 85-102..

Wadhwa, P.D., Sandman, C.A., Porto, M., Dunkel-Schetter, C. & Garite, T.J. (1993). The association between prenatal stress and infant birth weights and gestational age at birth: a prospective investigation. *American Journal of Obstetrics and Gynaecology*, 169, 858-865.



Warner, R., Appleby, L., Whitton, A. & Faragher, B. (1996). Demographic and obstetric risk factors for postnatal psychiatric morbidity. *British Journal of Psychiatry*, 168(5), 607-611.

Watson, C., Juba, M., Anderson, P. & Manifold, V. (1990). What does the Keane et al. PTSD Scale for the MMPI measure? *Journal of Clinical Psychology*, 46, 600-606.

Wegner, D.M. (1994). Ironic processes of mental control. *Psychological Review*, 101(1), 34-52.

Wegner, D.M. & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality*, 62, 615-640.

Weissman, M.M. & Bothwell, S. (1976). Assessment of social adjustment by patient self-report. *Archives of General Psychiatry*, 33, 1111-1115.

Wickberg, B. & Hwang, C.P. (1997). Screening for postnatal depression in a population-based Swedish sample. *Acta Psychiatrica Scandinavica*, 95(1), 62-66.

Williams, K. & Koran, L. (1997). Obsessive-compulsive disorder in pregnancy, the puerperium and the premenstruum. *Journal of Clinical Psychiatry*, 58, 330-334.

Windridge, K.C. & Berryman, J.C. (1999). Women's experiences of giving birth after 35. *Birth*, 26(1), 16-23.

Wisner, K.L., Peindl, K.S., Gigliotti, T. & Hanusa, B.H. (1999). Obsessions and compulsions in women with postpartum depression. *Journal of Clinical Psychiatry*, 60, 176-180.

**Appendix 1: Ethics approval certificate**

## LOTHIAN RESEARCH ETHICS COMMITTEE

### CERTIFICATE OF ETHICAL OPINION

LREC Reference Number: LREC/2003/7/38

Title: The effects of sub clinical levels of anxiety and depression on unpleasant intrusive thoughts in a non-clinical sample of mothers.

Researcher: Ms Tara Woodward

The Primary Care/Public & Mental Health Research Ethics Committee of the Lothian Research Ethics Committee (the Committee) reviewed this proposed research and is of the opinion that it is ethical and appropriate to be carried out in the Lothian Area. This opinion encompasses all aspects of the application including the Patient/Subject Information Sheet and all other accompanying documentation provided.

The LREC application form, protocol, subject information sheet, information on compensation arrangements, payments to researchers and the provision of expenses to subjects (where appropriate) were reviewed and approved and the members of the Committee present at the meeting are shown on the attached *Membership List*.

This opinion is issued subject to the following conditions and is invalid if they are not followed:

- You must obtain appropriate management approval from the relevant NHS Trust(s) before starting the proposed research. It is the NHS Trust(s) that ultimately decide whether or not this research should go ahead taking account of the advice of the Local Research Ethics Committee.
- You must notify the Sub-Committee and the relevant NHS Trust(s), in advance, of any significant proposed deviation from the original protocol or application form and obtain approval for any such amendments using the *Amendment Approval Request Form*.
- You must submit reports to the Sub-Committee and the NHS Trust(s) once the study is underway if there are any unusual or unexpected results which raise questions about the safety of the research.
- You must report annually on successes, or difficulties, in recruiting subjects in order to provide useful feedback on perceptions of the study among patients and volunteers using the *Progress Report Form*.
- Where the study is terminated prematurely you must report within fifteen days indicating the reasons for early termination.
- You must submit a final report within three months of the completion of the study using the *Progress Report Form*.
- This opinion does not cover the inclusions of adults with incapacity in any study. Such opinion can only be given by the Multi-Centre Research Ethics Committee for Scotland.



**Peter Reith**  
Secretary  
Lothian Research Ethics Committee



**Stephanie Butler**  
Administrator  
Primary Care/Public & Mental Health  
Research Ethics Committee

4 January 2004

**Appendix 2: Participant’s details form**

## Participant Details

Some personal details are required from each participant to assist in the interpretation of the study results. Midwife and GP details are taken to check your circumstances at follow up, or should you wish a referral to be made on your part.

### Personal Details

**Name:**..... **Age:**.....

**Contact details**.....

**Marital Status** (please circle as appropriate)      Single      Married/partner

**Occupation:**.....

**Occupation of Spouse:**.....

**Schooling:** (please circle level of schooling attained)

no exams taken    Standard Grades    Highers    undergraduate degree    post graduate degree

**Ethnic Group:**      White    Black-Caribbean      Black-African    Black-other (please  
describe.....      Indian      Pakistani      Bangladeshi      Chinese

Any other Ethnic Group:.....

### Pregnancy Details

Weeks gestation:.....      Due date:.....

Previous miscarriages.....      Terminations.....

Number of children.....

Medical intervention during pregnancy?    YES.....    NO

Do you have any medical conditions?    YES.....    NO

**Name of Midwife**.....

**Location and phone number:**.....

.....  
.....

**Name of GP**.....

**Location and number:**.....

.....  
.....  
.....

**Appendix 3: Edinburgh Postnatal Depression Scale (EPDS)**

## **Edinburgh Post Natal Depression Scale (EPDS)**

(J.L. Cox, J.M. Holden, R. Sagovsky, Department of Psychiatry, University of Edinburgh)

Name:

EPDS Score:

\_\_\_\_\_

Assessment Date:

Assessor:

As you are pregnant/ have recently had a baby, we would like to know how you are feeling. Please underline the answer which comes closest to how you have felt in the past 7 days - Not just how you feel today.

Here is an example, already completed:

I have felt happy:

Yes, all the time

Yes, most of the time

No, not very often

No, not at all

This would mean "I have felt happy most of the time during the past week". Please answer the following 10 questions by underlining the appropriate statement. Thank You.

### **In the past 7 days:**

1. I have been able to laugh and see the funny side of things -

As much as I always could

Not quite so much now

Definitely not so much now

Not at all

2. I have looked forward with enjoyment to things -

As much as I ever did

Rather less than I used to

Definitely less than I used to

Hardly at all

3. I have blamed myself unnecessarily when things went wrong -

Yes, most of the time

Yes, some of the time

Not very often

No, never

4. I have been anxious or worried for no good reason -

No, not at all  
Hardly ever  
Yes, sometimes  
Yes, very often

5. I have felt scared or panicky for no good reason -

Yes, quite a lot  
Yes, sometimes  
No, not much  
No, not at all

6. Things have been getting on top of me -

Yes, most of the time I haven't been able to cope at all  
Yes, sometimes I haven't been coping as well as usual  
No, most of the time I have coped quite well  
No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping -

Yes, most of the time  
Yes, sometimes  
Not very often  
No, not at all

8. I have felt sad or miserable -

Yes, most of the time  
Yes, quite often  
Not very often  
No, not at all

9. I have been so unhappy that I have been crying -

Yes, most of the time  
Yes, quite often  
Only occasionally  
No, never

10. The thought of harming myself has occurred to me -

Yes, quite often  
Sometimes  
Hardly ever  
Never



**Appendix 4: Maudsley Obsessive-Compulsive Inventory (MOCI)**

## Maudsley Obsessive Compulsive Inventory (Hodgson and Rachman 1977)

**Instructions:** Please answer each question by putting a circle around “TRUE” or “FALSE” after the question. There are no right or wrong answers and no trick questions. Work quickly and do not think too long about the exact meaning of each question.

- |  |      |       |
|--|------|-------|
| 1. I avoid using public phones due to possible contamination.  | TRUE | FALSE |
| 2. I frequently get nasty thoughts and have difficulty getting rid of them.                              | TRUE | FALSE |
| 3. I am more concerned than most people about honesty.   | TRUE | FALSE |
| 4. I am often late because I can't seem to get through everything on time.                               | TRUE | FALSE |
| 5. I don't worry unduly about contaminations if I touch an animal.                                       | TRUE | FALSE |
| 6. I frequently have to check things. (e.g gas or water, taps doors etc ) several times.                 | TRUE | FALSE |
| 7. I have a very strict conscience.  | TRUE | FALSE |
| 8. I find that almost everyday I am upset by unpleasant thoughts that come into my mind against my will. | TRUE | FALSE |
| 9. I do not worry unduly if I accidentally bump into somebody.   | TRUE | FALSE |
| 10. I usually have serious doubts about the simple everyday things that I do.                            | TRUE | FALSE |
| 11. Neither of my parents were very strict during my childhood.  | TRUE | FALSE |
| 12. I tend to get behind in my work, because I repeat things over and over again.                        | TRUE | FALSE |
| 13. I use only an average amount of soap.  | TRUE | FALSE |
| 14. Some numbers are extremely unlucky.  | TRUE | FALSE |
| 15. I do not check letters over and over again before posting them.                                      | TRUE | FALSE |
| 16. I do not take a long time to dress in the morning.   | TRUE | FALSE |
| 17. I am not excessively concerned about cleanliness.  | TRUE | FALSE |
| 18. One of my major problems is that I pay too much attention to detail.                                 | TRUE | FALSE |
| 19. I can use well-kept toilets without any hesitation.  | TRUE | FALSE |
| 20. My major problem is repeated checking.   | TRUE | FALSE |
| 21. I am not unduly concerned about germs and disease.   | TRUE | FALSE |
| 22. I do not tend to check things more than once.  | TRUE | FALSE |
| 23. I do not stick to a very strict routine when doing ordinary things.                                  | TRUE | FALSE |
| 24. My hands do not feel dirty after touching money.   | TRUE | FALSE |
| 25. I do not usually count when doing a routines task.   | TRUE | FALSE |

26. I take rather a long time to complete my washing in the morning.	TRUE	FALSE
27. I do not use a great deal of antiseptics.	TRUE	FALSE
28. I spend a lot of time each day checking things over and over again.	TRUE	FALSE
29. Hanging and folding my clothes at night does not take up a lot of time.	TRUE	FALSE
30. Even when I do something very carefully, I often feel that it is not quite right.	TRUE	FALSE

**Appendix 5: State/Trait Anxiety Inventory (STAI)**

# SELF-EVALUATION QUESTIONNAIRE

## STAI Form Y-1

Please provide the following information:

Name \_\_\_\_\_ Date \_\_\_\_\_ S \_\_\_\_\_

Age \_\_\_\_\_ Gender (Circle) M F T \_\_\_\_\_

### DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right now*, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

NOT AT ALL  
SOMEWHAT  
MODERATELY SO  
VERY MUCH SO

- |  |   |   |   |   |
|--|---|---|---|---|
| 1. I feel calm .....                                       | 1 | 2 | 3 | 4 |
| 2. I feel secure .....                                     | 1 | 2 | 3 | 4 |
| 3. I am tense .....  | 1 | 2 | 3 | 4 |
| 4. I feel strained .....                                   | 1 | 2 | 3 | 4 |
| 5. I feel at ease .....                                    | 1 | 2 | 3 | 4 |
| 6. I feel upset .....                                      | 1 | 2 | 3 | 4 |
| 7. I am presently worrying over possible misfortunes ..... | 1 | 2 | 3 | 4 |
| 8. I feel satisfied .....                                  | 1 | 2 | 3 | 4 |
| 9. I feel frightened .....                                 | 1 | 2 | 3 | 4 |
| 10. I feel comfortable .....                               | 1 | 2 | 3 | 4 |
| 11. I feel self-confident .....                            | 1 | 2 | 3 | 4 |
| 12. I feel nervous .....                                   | 1 | 2 | 3 | 4 |
| 13. I am jittery .....                                     | 1 | 2 | 3 | 4 |
| 14. I feel indecisive .....                                | 1 | 2 | 3 | 4 |
| 15. I am relaxed .....                                     | 1 | 2 | 3 | 4 |
| 16. I feel content .....                                   | 1 | 2 | 3 | 4 |
| 17. I am worried .....                                     | 1 | 2 | 3 | 4 |
| 18. I feel confused .....                                  | 1 | 2 | 3 | 4 |
| 19. I feel steady .....                                    | 1 | 2 | 3 | 4 |
| 20. I feel pleasant .....                                  | 1 | 2 | 3 | 4 |

**Appendix 6: Intrusive thoughts interview**

## Intrusive Thoughts Interview

Participant's Name.....

**Information:** Intrusive thoughts are naturally occurring human phenomena. They are uncontrollable thoughts about often-unpleasant events or actions. They can be verbal thoughts that may begin with the words "what if....." or they can be picture images or even impulses to act in a way that would be unacceptable to the person experiencing them.

### List of Emotions

Anger	Fear	Sadness	Distress	Confusion	Worry
Anxiety	Shame	Embarrassment	Guilt	Shock	Disgust

### Instructions

Please read the statements below and circle the response that best describes how often this has occurred to you. If these thoughts have occurred, please choose an emotion from the list above or choose one yourself that best represents how you felt when you had the thought.

**1:** *Since becoming pregnant/ the birth of your baby, have you experienced any of the type of thoughts described by the researcher?*

<b>Never</b>	<b>&lt;10 month</b>	<b>&gt;10 month</b>	<b>10+ week</b>
0	1	2	3

**1a:** *If so, how emotionally intense did you find these thoughts?*

<b>Didn't bother me</b>	<b>slightly intense</b>	<b>felt quite intense</b>	<b>Very intense</b>
0	1	2	3

**1b:** *How difficult was it to dismiss these thoughts?*

<b>Easy</b>	<b>a bit difficult</b>	<b>very difficult</b>	<b>Impossible</b>
0	1	2	3

**1c:** *Did you do anything to get rid of the thought?*

<b>No response</b>	<b>thought attentively</b>	<b>distracted myself</b>	<b>did something else</b>
0	1	2	.....